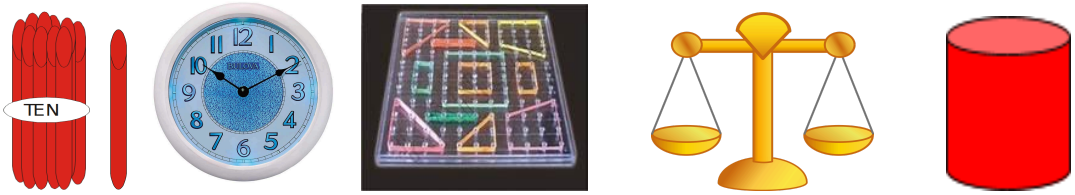
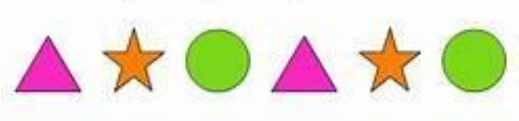
LET US UNDERSTAND MATHEMATICS CLASS 2

23 + 7 89 - 67





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PREFACE

This is the second of a series of books based on the NCERT syllabus and research on the teaching of mathematics.

The focus here is on an understanding of concepts and procedures. The concepts and procedures are presented by manipulatives, pictures, real-world situations, spoken and written words and symbols and videos that enhance their learning. Opportunities are provided for communication, translation from one mode to another and applications to daily life. The teachers should use manipulatives that are commercially available or can be made and use situations for exercises that are familiar to the children in the class.

As most of the schools in India have paucity of resources, we will use sticks for activities with number concepts. The sticks can be replaced by abacus or base ten blocks.

The schools that can afford should provide materials such as counters, Al abacus, pattern blocks, geometrical models, geoboards, fake money, and use these for explaining concepts and procedures.

If the schools/students cannot afford these, teachers can make models of different 2-D and 3–D shapes using cardboard and use dot paper instead of Geoboard. The students can be asked to bring buttons, scissors, and empty boxes, containers of different shapes and sizes from home.

All children should at least have 100 sticks of the same length and rubber bands(they can buy pop sticks or toothpicks) and dot paper.

As for most teachers, the textbook is the curriculum. This book is a teaching guide cum workbook for students. As the children have not yet developed the reading skills, the concepts, operations and word problems should be learnt and tested orally first. The exercises with manipulatives and oral work are included to facilitate that.

Some activity sheets are also provided that can be printed and used by students.

Table of Contents

Unit 1-Numbers	3
Unit 2-Ordinal Numbers	23
Unit 3-Geometry	25
Unit 4-Addition	40
Unit 5-Subtraction	63
Unit 6-Money	82
Unit 7-Measurement	87
Unit 8-Equal Groups	92
Unit 9-Time	101
Unit 10-Patterns	106
Unit 11-Collection and Organization of Data	110
Activity-Sheets	114
Appendices	120

UNIT I

Numbers 1-100

Show the video: https://youtu.be/lAQ2HTqTl2w
We had learned numbers from 1-100. We can write them in a table called Hundred Table. It helps us to see patterns in numbers.

1	2	3	4	5	6	7	8	9	10
11	12	13	h14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1. We can count all numbers from 1 to 100 by reading all the numbers from left to right row wise, beginning with the first number of the first row and column that is 1, then reading the next row in this manner, and so on.
   Similarly, we can count back from 100-1 by reading the numbers from right to left row wise, beginning with the last number of the last row, then reading the row before that in this manner and so on.

2. We can **count by ten** reading the last column from 10 to 100-10, 20, 30, 40, 50, 60, 70, 80, 90, and 100.
3. We can **count by five** by shading every fifth number up to 100 - 5, 10, 15, 20, 25, 30, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100.
4. We can **count by two** by reading alternate numbers – 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, ...

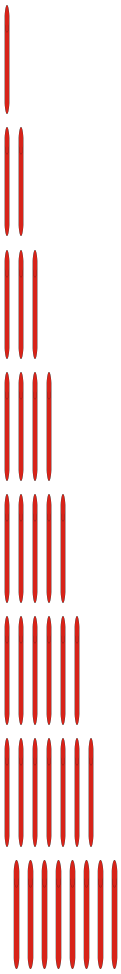
What other patterns do you notice in the table?

Representing numbers by using objects

We had also learned how to use the concept of place value to write the numbers using the concept of place value using digits 0-9 only.

We can represent numbers by grouping them by 10.

The representation of the numbers using bundles of ten sticks and one sticks is given below. It makes it easier to find the number of objects in one collection and to compare the number of objects in two collections, when we have a large number of objects.



1-One

2-Two

3-Three

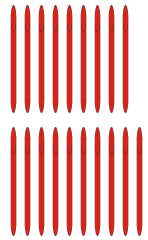
4-Four

5-Five

6-Six

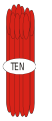
7-Seven

8-Eight

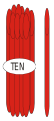


9-Nine

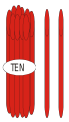
10-Ten or



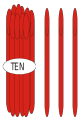
1 Ten



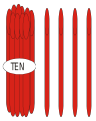
10 +1 = 11-Eleven



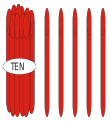
10 +2 = 12-Twelve



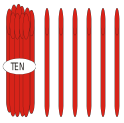
10 + 3 = 13-Thirteen



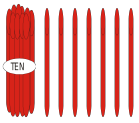
10 + 4 = 14-Fourteen



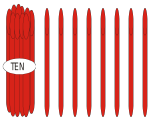
10 + 5 = 15-Fifteen



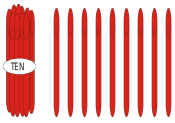
10 + 6 = 16-Sixteen



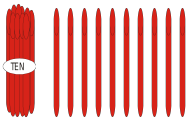
10 + 7 = 17-Seventeen



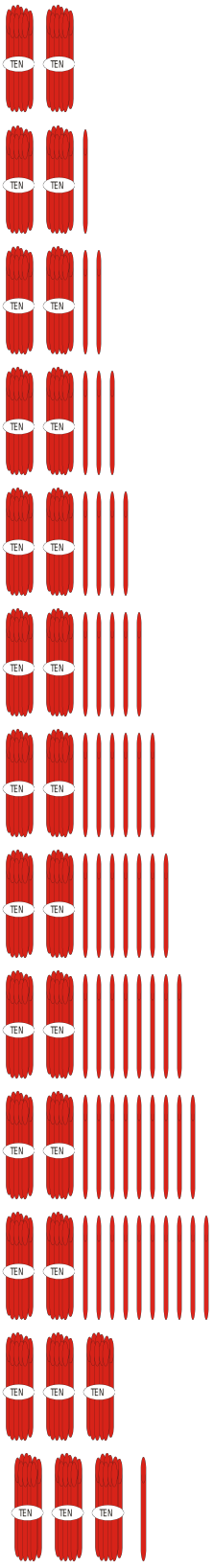
10 + 8 = 18-Eighteen



10 + 9 = 19-Nineteen



10 + 10 =20-Twenty or



Two tens

20 + 1-Twenty one

20 + 2-Twenty two

20 + 3-Twenty three

20 + 4-Twenty four

20 + 5-Twenty five

20 + 6-Twenty six

20 + 7-Twenty seven

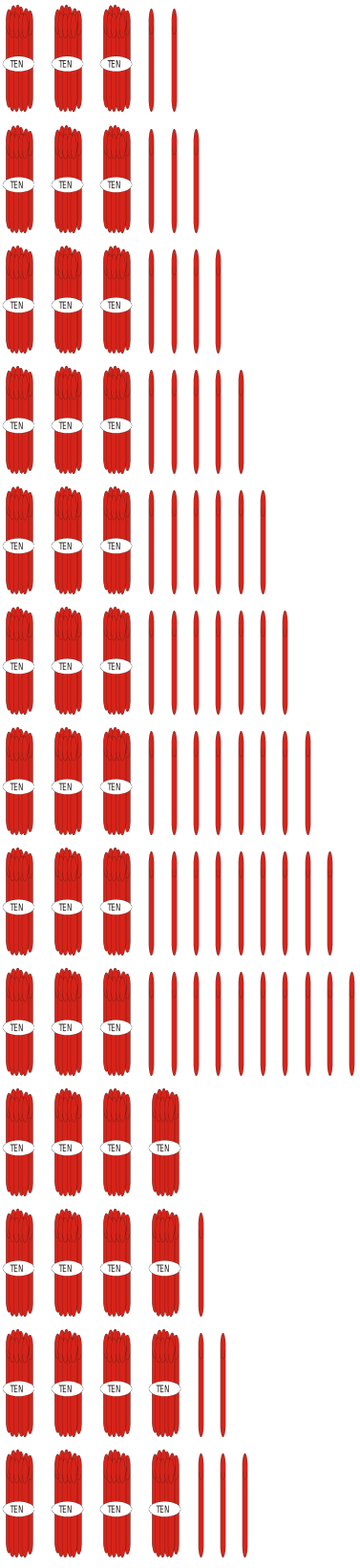
20 + 8-Twenty eight

20 + 9-Twenty nine

20 + 10-Thirty or

Three tens

30 +1 = 31-Thirty one



30 + 2 = 32-Thirty two

30 + 3 = 33-Thirty three

30 + 4 = 34-Thirty four

30 + 5 = 35-Thirty five

30 + 6 = 36-Thirty six

30 + 7 = 37-Thirty seven

30 + 8 = 38-Thirty eight

30 + 9 = 39-Thirty nine

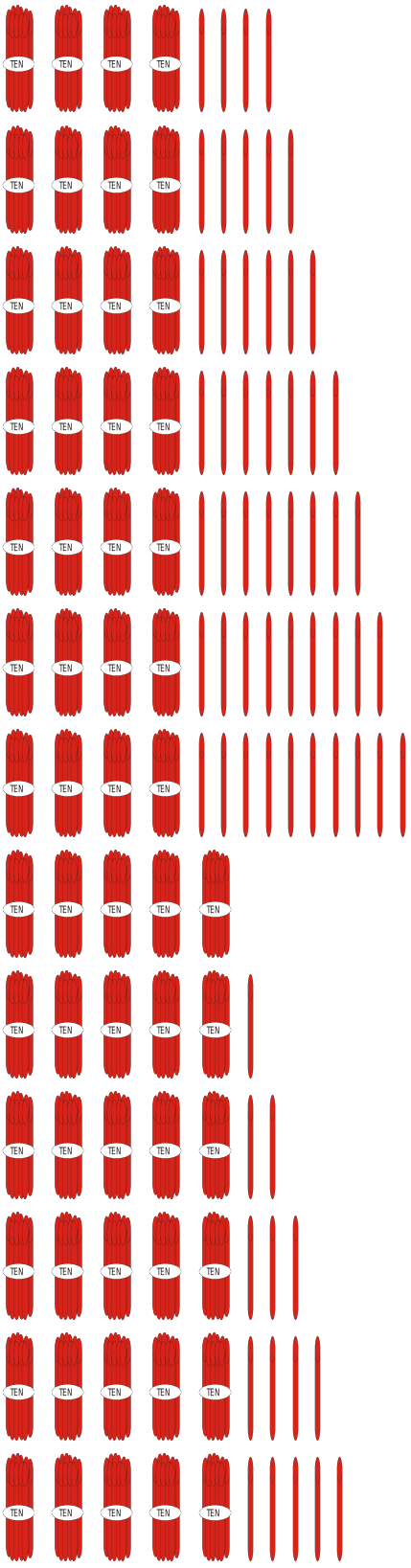
30 + 10 = 40-Forty or

Four tens

40 + 1 = 41-Forty one

40 + 2 =42-Forty two

40 + 3 =43-Forty three



40 + 4 =44-Forty four

40 + 5 =45-Forty five

40 + 6 =46-Forty six

40 + 7 =47-Forty seven

40 + 8 =48-Forty eight

40 + 9 =49-Forty nine

40 + 10 =50-Fifty or

Five tens

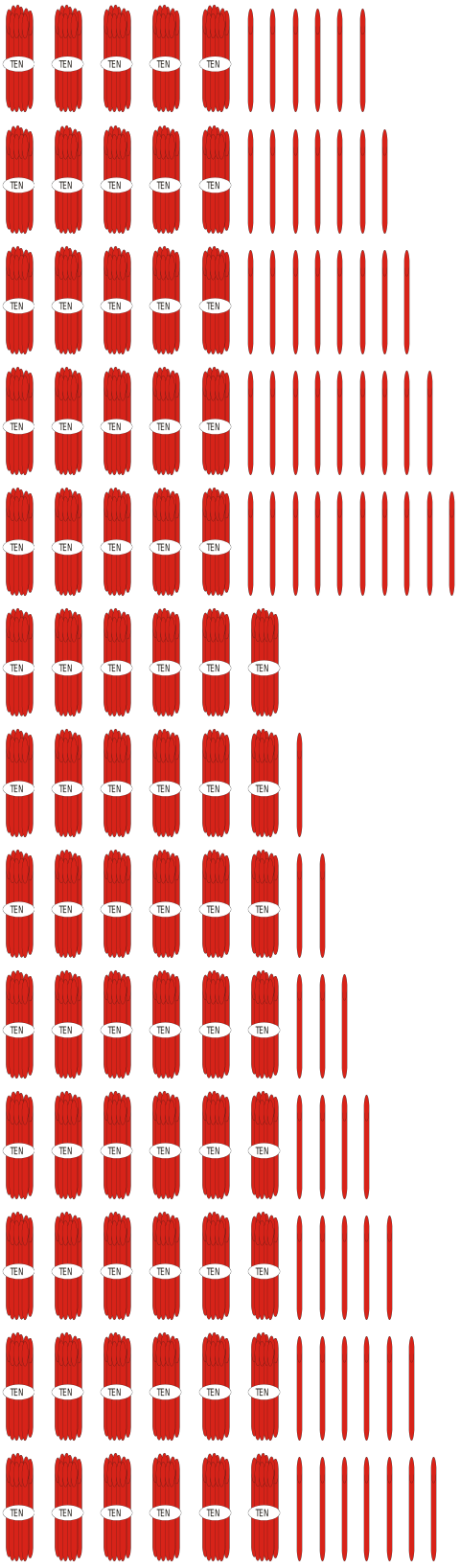
50 + 1 = 51-Fifty one

50 + 2 = 52-Fifty two

50 + 3 = 53-Fifty three

50 + 4 = 54-Fifty four

50 + 5 = 55-Fifty five



50 + 6 = 56-Fifty six

50 + 7 = 57-Fifty seven

50 + 8 = 58-Fifty eight

50 + 9 = 59-Fifty nine

50 + 10 = 60-Sixty or

6 Tens

60 + 1 = 61-Sixty one

60 + 2 = 62-Sixty two

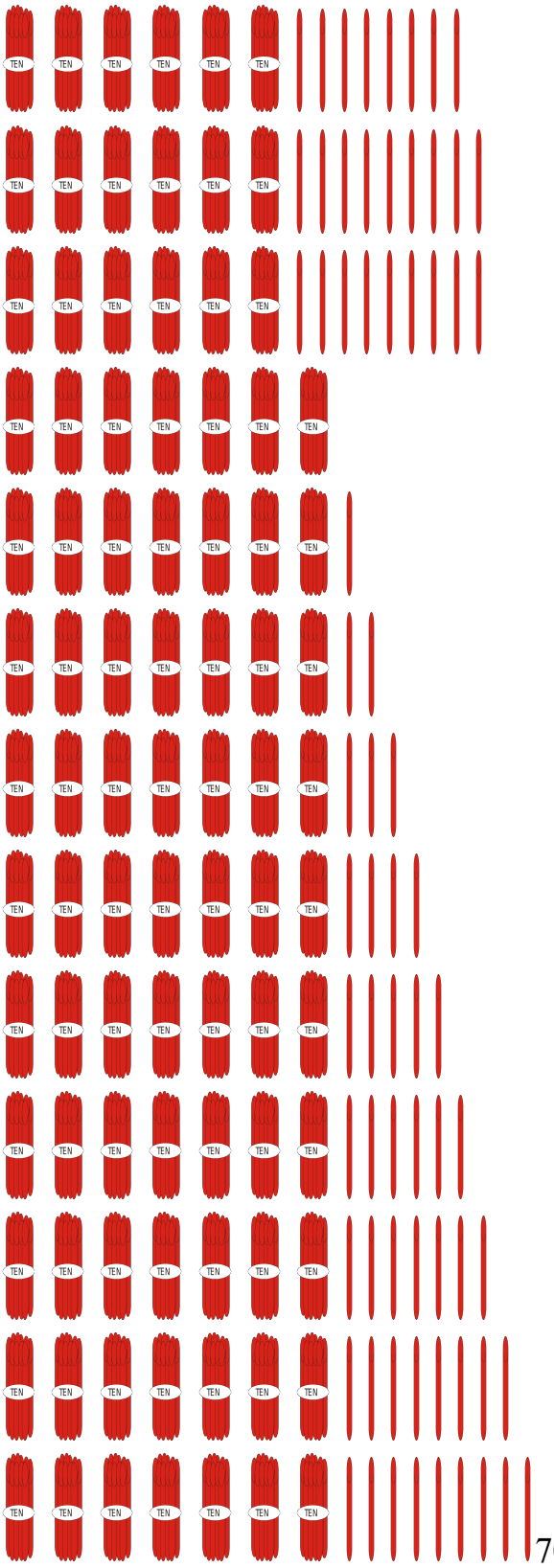
60 + 3 = 63-Sixty three

60 + 4 = 64-Sixty four

60 + 5 = 65-Sixty five

60 + 6 = 66-Sixty six

60 + 7 = 67-Sixty seven



60 + 8 = 68-Sixty eight

60 + 9 = 69-Sixty nine

60 + 10 = 70-Seventy or

7 Tens

70 + 1 = 71-Seventy one

70 + 2 = 72-Seventy two

70 + 3 = 73-Seventy three

70 + 4 = 74-Seventy four

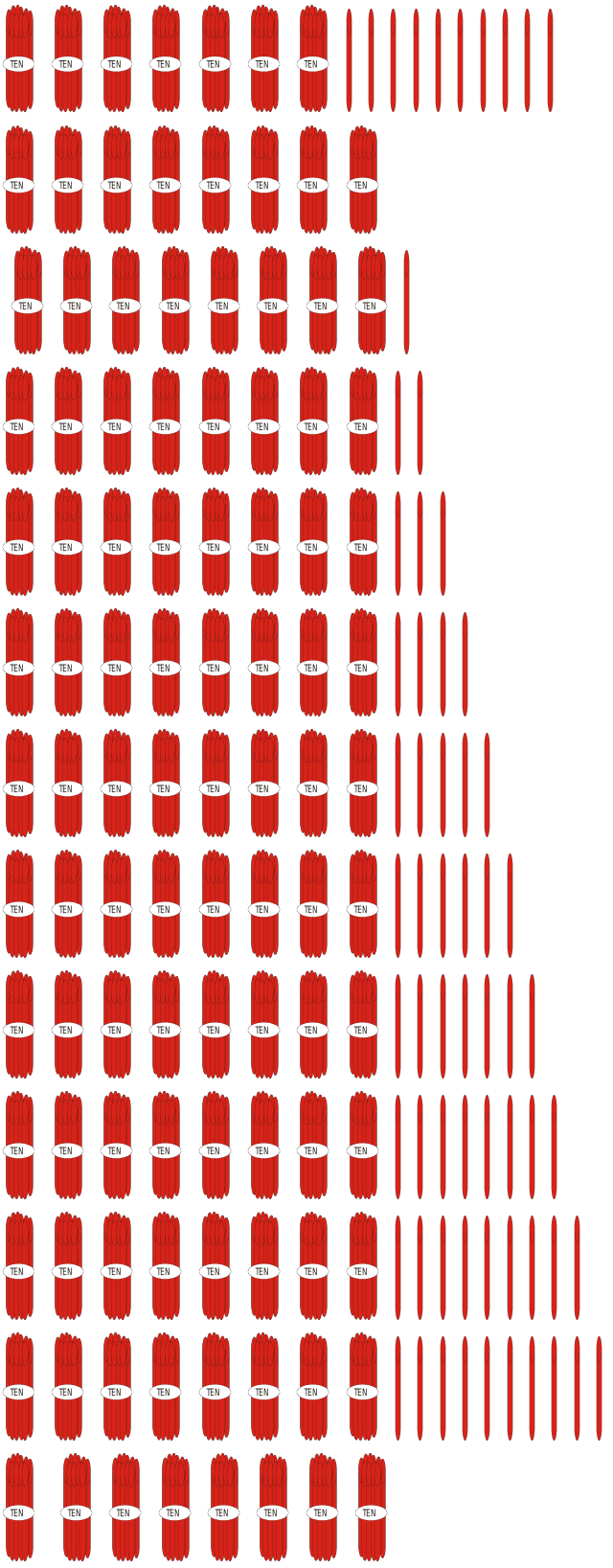
70 + 5 = 75-Seventy five

70 + 6 = 76-Seventy six

70 + 7 = 77-Seventy seven

70 + 8 = 78-Seventy eight

70 + 9 = 79-Seventy nine



70 + 10 = 80-Eighty or

8 Tens

80 + 1 = 81-Eighty one

80 + 2 = 82-Eighty two

80 + 3 = 83-Eighty three

80 + 4 = 84-Eighty four

80 + 5 = 85-Eighty five

80 + 6 = 86-Eighty six

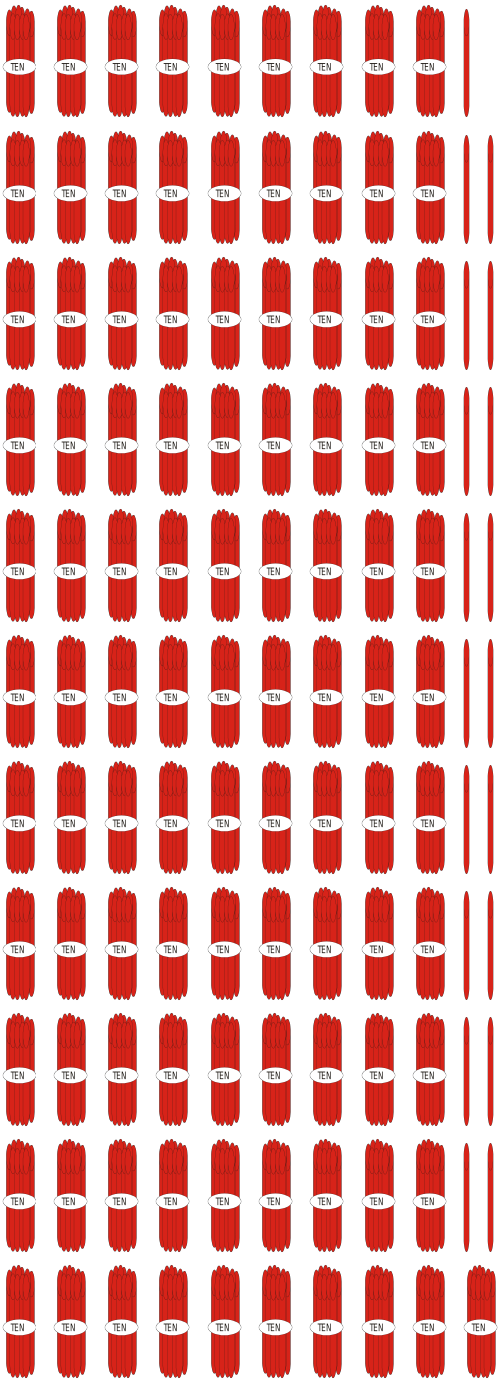
80 + 7 = 87-Eighty seven

80 + 8 = 88-Eighty eight

80 + 9 = 89-Eighty nine

80 + 10 = 90 or

9 Tens



90 + 1 = 91-Ninety one

90 + 2 = 92-Ninety two

90 + 3 = 93-Ninety three

90 + 4 = 94-Ninety four

90 + 5 = 95-Ninety five

90 + 6 = 96-Ninety six

90 + 7 = 97-Ninety seven

90 + 8 = 98-Ninety eight

90 + 9 = 99-Ninety nine

90 + 10 = 100-Hundred

10 Tens or 1 Hundred

As we have 10 tens, we need to group them again into a group of 10 tens and give it a name. We name it **one hundred** and write it as 100.

As tens were placed to the left of ones, we write 1 for one hundred to the left of tens place and name that as **hundreds place**.

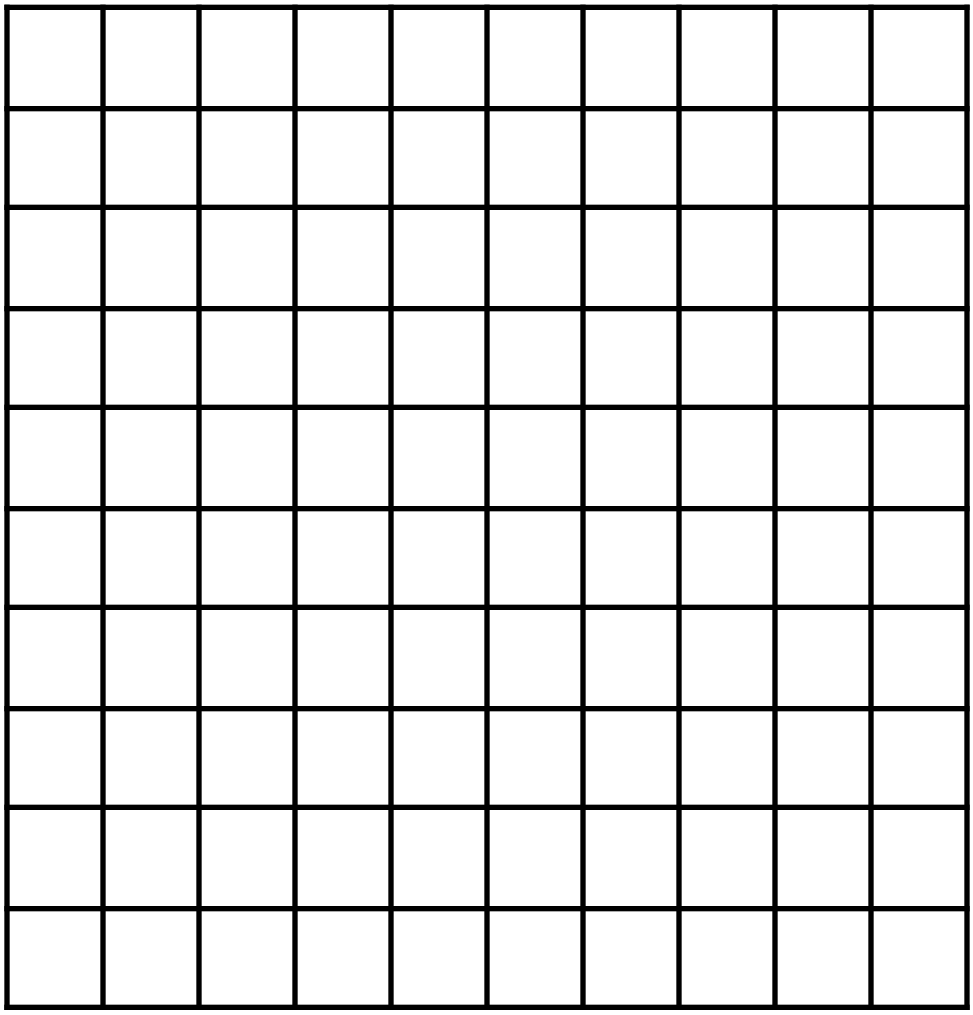
As there are no ten sticks or single sticks left, we write zeros in tens and ones place.

Writing numbers in terms of tens and ones.
As each number can be represented by a number of groups of any ten objects and single objects. We may write numbers as a combination of tens and ones.
For example, 25 has 2 bundles of ten-sticks and 5 single sticks, we can write
25 = 2 tens + 5 ones.
Similarly, we can write
38 = 3 tens + 8 ones
40 = 4 tens + 0 ones
7 = 0 tens + 7 ones
This is called the expanded form of numbers.

Exercise 1.1

1. Count up to 100. Provide practice in it till students are fluent in it.
2. Count back from 100-1
3. Write numbers from 1-100 in the table given below:

Hundred Table



4. Write missing numbers in the hundred table.

1	2	3		5	6	7	8	9	10
11	12	13	14	15	16		18	19	20
21	22	23		25	26	27	28		30
31	32	33	34	35		37	38	39	40
41	42	43	44		46	47	48	49	
51	52		54	55	56	57	58	59	60
61	62	63		65	66		68	69	70
71	72	73		75	76	77	78	79	80
81	82	83	84	85		87	88	89	
91	92		94	95	96	97		99	100

5. Count numbers by 10 up to 100.

6. Count numbers by 5 up to 50.

7. Count numbers by 2 up to 20.

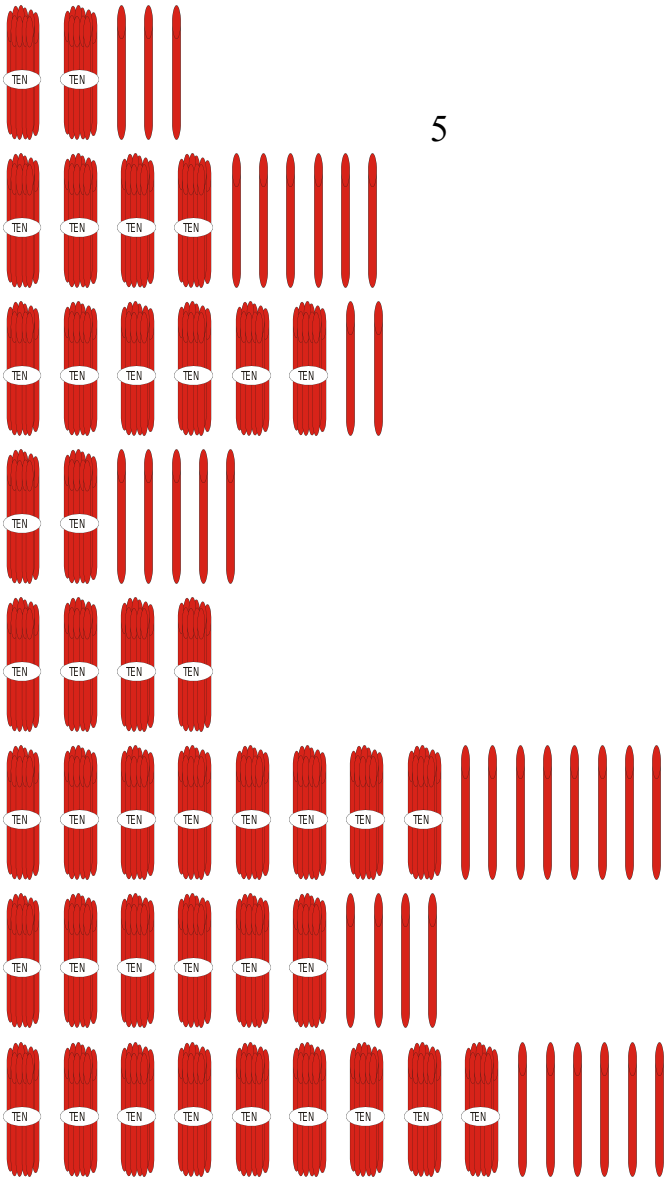
8. Set aside the following numbers of sticks using bundles of ten-sticks and single sticks.

   6, 14, 19, 35, 37, 48, 52, 26, 60, 78, 84, 98, 100

9. Read the following numbers:

6, 12, 14, 39, 56, 72, 43, 27, 79, 58, 86, 90, 31, 66 and 100.

10. A number of bundles of ten-sticks and single sticks are given below write the total number of sticks against them:



5 23

_____

_____

_____

_____

_____

_____

_____

11. Write the following numbers (To be dictated by the teacher):
9, 18, 23, 38, 54, 67, 90, 82, 46, 59, 41, 75, 14, 28 and 40.

12. Write 4 numbers in counting that come after the numbers given below:

    6 - 7, 8, 9, 10

    12

    19

    28

    79

13. Write 4 numbers in counting back from the numbers given below:

    10 - 9, 8, 7, 6

    9 -

    20 -

    28 -

    70 -

    80 -

    100 -

14. Write the following numbers as the sum of tens and ones:

    35 = 3 tens + 5 ones

    13 = ___ten + ___ones

    45 = ___tens + ___ones

    69 = ___tens + ___ones

    27 = ___tens + ___ones

75 = ___tens + ___ones

60 = ___tens + ___ones

8 = ___ tens + ___ones

15. Write the numbers for the following:

2 tens + 5 ones = 25

7 tens + 4 ones = _____

9 tens + 9 ones = _____

6 tens + 2 ones = _____

2 tens + 8 ones = _____

16. Count the number of girls and boys in the class.

17. Where do you find numbers in your surroundings?

18. Write the following numbers in words:

1	one
2	_____
3	_____
4	_____
5	_____
6	_____
7	_____
8	_____

9 _____

10 _____

11 _____

12 _____

13 _____

14 _____

15 _____

16 _____

17 _____

18 _____

19 _____

20 _____

30 _____

40 _____

50 _____

60 _____

70 _____

80 _____

90 _____

100 _____

Comparison of Numbers

The number that comes later in counting is larger. For example, 31 comes after 23 in counting, therefore 31 is greater than 23. We write it as $31 > 23$.
The number that comes earlier in counting is smaller. As 8 comes before 11, 8 is less than 11. We write it as $8 < 11$.
Alternatively, we can express numbers in terms of tens and ones and compare the number of tens; a number with a larger number of tens is larger. For example, to compare 48 and 63, we write
48 = 4 tens + 8 ones
63 = 6 tens + 3 ones
As the number of tens in 63 is large, $63 > 48$.
If the number of tens in both numbers is the same, then the number with a larger number of ones is larger. For example, 36 and 32 both have 3 tens, but 36 has 6 ones and 32 has 2 ones. As $6 > 2$ therefore $36 > 32$.

Exercise 1.2

1. Compare the following numbers by writing < or > or = between the following numbers:

9		4
22		26
35		35
99		100
21		25
36		22
14		17
15		19
1		4

5		7
19		18
36		42
78		78
48		50
35		61
85		72
17		17
56		56

2. Arrange the following numbers from smallest to largest):

(a) 45, 8

(b) 30, 73, 67

(c) 92, 54, 57

3. Arrange the following numbers from largest to smallest:

   (a) 7, 30

   (b) 60, 67

   (c) 47, 49

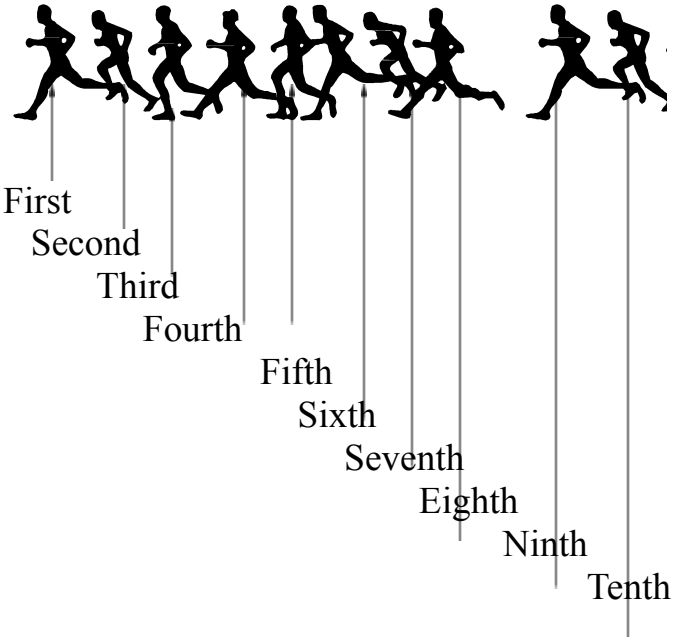
4. Write the smallest number using digits 4 and 7 using each digit once only.

5. Write the largest number using digits 3 and 9 using each digit once only.

UNIT 2

Ordinal numbers

Ask ten students to form a queue and ask such questions as: Who is just after Rajat in the queue? Who is just before Varun in the queue? Who is between Meeta and Karan in the queue?
We describe the position of different children in the queue by using number words first, second, third, and so on. Describe the queue by naming children in various positions.
The position of different runners in a race is as follows:



Similarly when doing something requires many steps in order such as in taking a bath, the step you start with is called first, the next step second, the one that follows it third and so on.
Give examples.
The second here is always second unlike counting objects in a collection in which any object can be counted as two.

Exercise 2

1. Ask ten students to form a line and ask children to name students who are in different positions such as third, sixth, eighth, tenth and so on.

2. Tell the steps in order in brushing your teeth.

3. Write 3 under the third runner, 6 under the sixth runner.

4. Write 2 under the second mouse, 5 under the fifth mouse.

5. Write 1 under the first, 3 under the third, last under the last leopard in the race.

UNIT 3

Geometry

Two Dimensional or 2-D Shapes

Show the video: (https://youtu.be/8EBrpmwI468 (Start on 10 minutes.)

Activity 3.1

Give an assortment of squares, rectangles, triangles, circles, parallelograms, trapeziums, and hexagons to students and ask them to sort similar shapes in different piles and write the name of shapes in each pile.

_____ _____ _____ _____

_____ _____ _____

If the students do not have pattern blocks, ask them to cut the shapes in Activity Sheet 2.2.

Activity 3.2

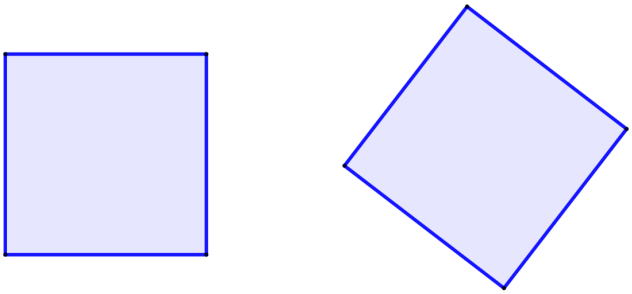
1. Ask the students to make the following shapes on a Geoboard or Dot paper given in Activity sheet 2.2.
   A square
   A triangle
   A rectangle
   A parallelogram
   A trapezium
   A hexagon
2. Ask students to copy the figures made by the student sitting next to him/her.

Properties of 2-D shapes

Square

Show them a model of a square.
Show a **side** of the model of a square and ask them to show other sides.
Show a **corner** of the model of a square and ask them to show other corners.
Activities
Ask them to take a square from pattern blocks.
(If they do not have pattern blocks, ask them to make a model of a square by pasting a square from the pile made earlier on cardboard and cutting that.)
Trace a square with the help of a model of a square.

Rotate the square and trace it again. These are the tracings of a square and after it is rotated.

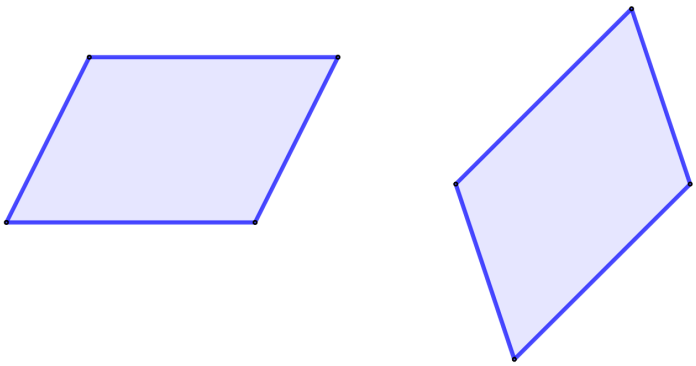


Is tracing of a square after rotation also a square?
How many sides and how many corners does a square have?
Are lengths of different sides the same?
Do all corners have the same shape?
Repeat this activity and questions with a
Rectangle
Triangle.

Activity 3.3

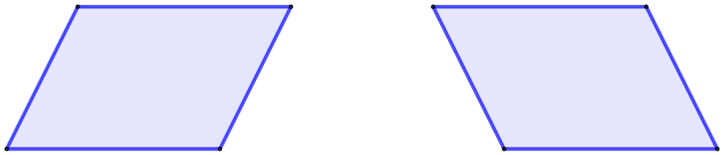
Parallelogram

Show them a model of a parallelogram.
Show a side of the model of a parallelogram and ask them to show other sides.
Show a corner of the model of a parallelogram and ask them to show other corners.
Ask students to trace a parallelogram with the help of a model.
Then ask them to rotate the parallelogram and trace it again.
A tracing of a parallelogram and its tracing after rotation is given below:



Is tracing of a rotation of the parallelogram also a parallelogram?
How many sides does a parallelogram have?
How many corners does a parallelogram have?
Do all sides of the parallelogram have the same length?
Do all the corners in a parallelogram have the same shape?

Now flip the model of the parallelogram and trace it again.
A tracing of a parallelogram and its tracing after flipping is given below:

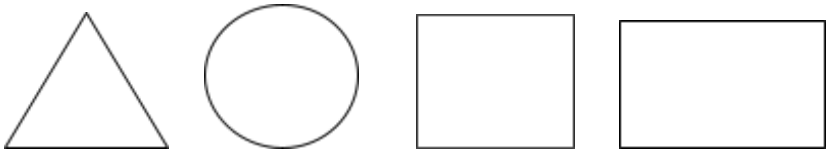


Is this also a parallelogram?
Repeat these activities and questions for a
Trapezium
Hexagon

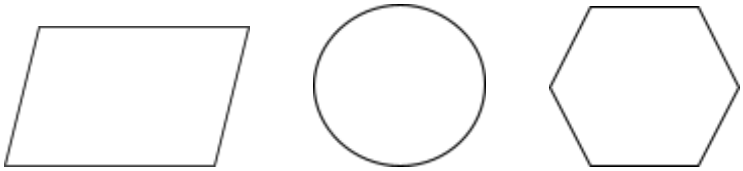
Circle
Ask them to draw a circle by tracing around its model.
How many sides does a circle have?
How many corners does a circle have?
Rotate the model of a circle and trace it.
Do the tracings differ now?
Flip the model of a circle and trace it.
Do the tracings differ now?

Exercise 3.1

1. Write the name of shapes given below:



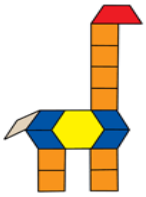
_____ _____ _____ _____

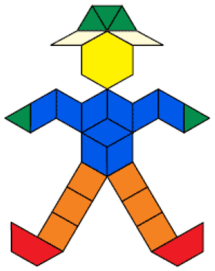


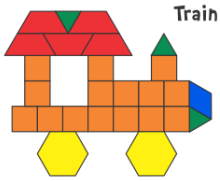
_____ _____ _____

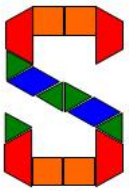
2. Make the following using toothpicks or matchsticks:
   (a) A square
   (b) A rectangle
   (c) A triangle
   (d) A parallelogram
   (e) A trapezium
3. Draw a circle with the help of a pattern block, coin, bangle, or any other circular object.

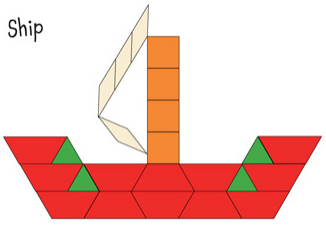
4. Name objects which have the same shape as a
   (a) square
   (b) rectangle
   (c) circle
   (d) triangle
   (e) hexagon
5. If students have pattern blocks, they can get creative and make figures of letters, animals, vehicles, etc.











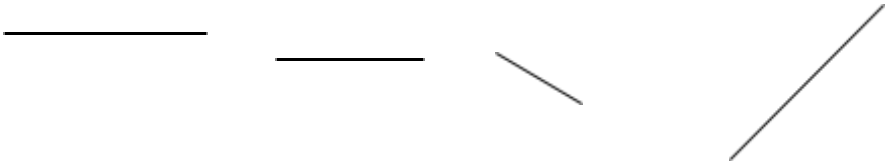
6. Make the following figures on a Geoboard/dot paper given in Activity sheet 2.1.
   (a) A square
   (b) A rectangle
   (c) A triangle
   (d) A parallelogram
   (e) A trapezium
7. Copy the figures made for Q.9 by the student sitting next to you so that it has the same size and shape as the figures made by him.

Straight and Curved lines
Activity 3.4
Show examples of **horizontal, vertical, slant, and curved lines** by holding a rope.

Drawings of horizontal, slant, and vertical lines are given below:

Horizontal Slant Vertical

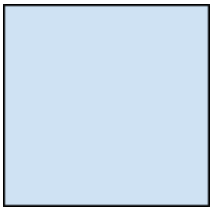
Horizontal, vertical, and slant lines are all **straight lines**

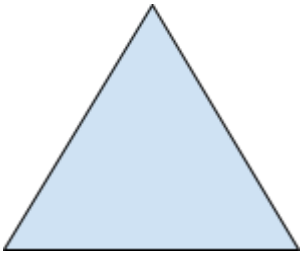


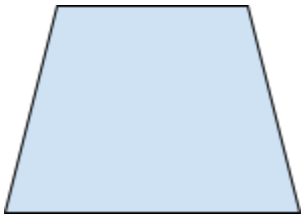
Drawings of some curved lines are given below:

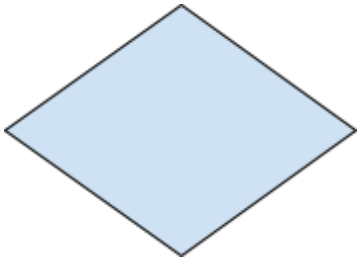
Exercise 3.2

1. Show models of straight lines in horizontal, vertical, slant positions by folding a paper.
2. Show a curved line by holding a rope.
2. Label different sides as horizontal, vertical, or slant by writing H or V or S along the sides in the following figures:

(a) 

(b) 

(c) 

(d) 

3. Make horizontal, vertical, and slant lines on a GeoBoard.

4. Make freehand drawings of horizontal, vertical, slant, and curved lines and label them.

5. Draw horizontal, vertical, and slant lines using a ruler.

6. Give examples of horizontal, vertical, slant, and curved lines in your surroundings.

Three dimensional (3-D) figures

Show them physical models of a sphere, cube, cuboid, cylinder, and cone.

Activity 3.5

Ask students to bring objects like small boxes, cans, balls, funnels from home; and sort these objects into groups so that all objects in a group have the same shape.

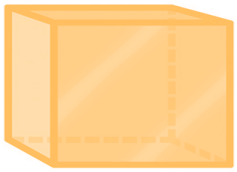
Name the shape in each pile.

Activity 3.6

Pictures of some objects are given in Activity Sheet 2.3. Cut and paste these objects in the following table so that all objects in a column have the same shape. Write the name of each shape in the first row of the column.

Exercise 3.3

1. Name objects which have the same shape as a
   (a) cube.
   (b) cuboid.
   (c) cylinder.
   (d) cone.
   (e) pyramid
   (f) sphere.
2. Which 3-D shapes can roll? Place a ✔ against them.
   (a) cube.
   (b) cuboid.
   (c) cylinder.
   (d) cone.
   (e) pyramid
   (f) sphere.
3. Which 3-D shapes can slide? Place a ✔ against them.
   (a) cube.
   (b) cuboid.
   (c) cylinder.
   (d) cone.
   (e) pyramid
   (f) sphere.
4. Which 3-D shapes can be used to make walls? Place a ✔ against them.
   (Remember a wall cannot have holes.)
   (a) cube.
   (b) cuboid.
   (c) cylinder.
   (d) cone.
   (e) pyramid
   (f) sphere.
5. Are there any shapes that can both roll and slide? If yes, name them.
6. Name the following 3-D shapes:



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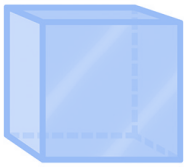

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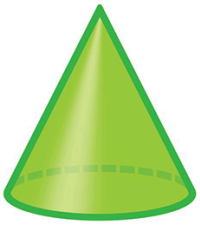

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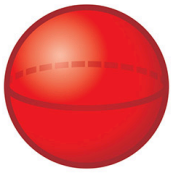

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Properties of 3-D Objects

Activity 3.7

Show students physical models of a cube, cuboid, cone, cylinder, pyramid, and sphere.

Show a face, corner, and edge of each of these space figures.

A face is a flat surface.

Then ask students

1. Show other faces, corners, and edges of each of these
2. How many faces, corners, and edges does each of these have?
3. Keep the faces of the solids on paper and trace these with a pencil and name them.

Activity 3.8

Make models of cube, cuboid, cone, and sphere with Styrofoam or clay.

If you keep these on your desk and cut them horizontally, guess what would be the shape of the cross-section and verify it.

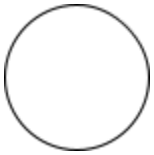
If you keep these on your desk and cut vertically, guess what would be the shape of the cross-section and verify it

Exercise 3.4

1. Name the space figure or figures that have one or more faces of the shapes given below and write them against the shapes.

_____

_____



_____

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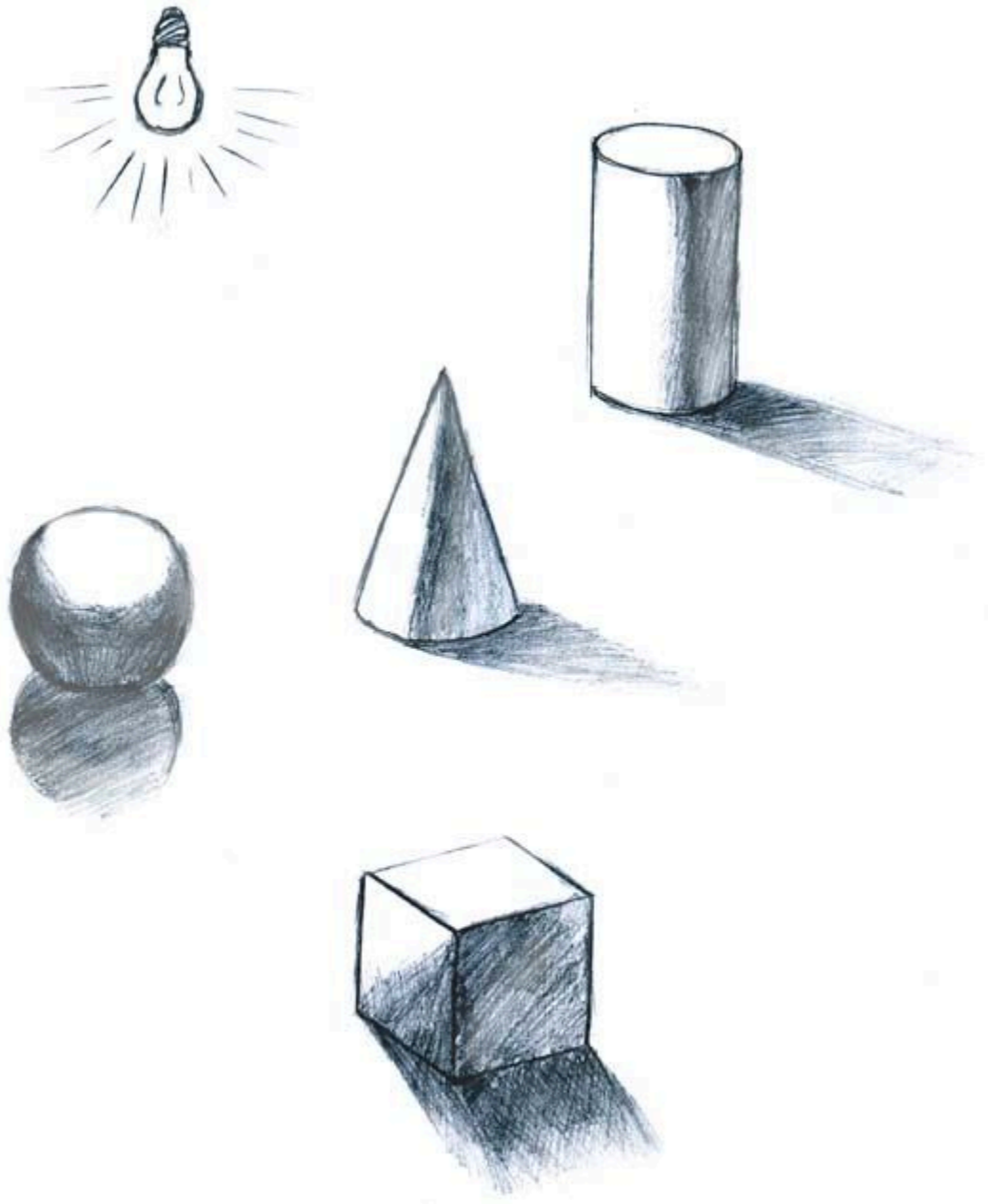
Shadows of Objects

Show the video: https://youtu.be/lOIGOT88Aqc

You all must have seen your own shadow and that of other objects. They vary in shapes and size. Some of the shadows cast by different objects are shown below:



Activity 3.10

Take the students outside at a time between 11 a.m. and 1 o'clock when the shadows are small. Find a place where students can spread out on an area of concrete and ask them

Where are your shadows?

Can everyone see his or her own shadow?

Where is it?

Is everyone's shadow visible?

Then ask

Where is the Sun?

Where is your shadow?

Then ask them to face the Sun, turn to the left and turn to the right and see where the shadow is in each of these positions?

What is true then about shadows and the Sun? (Shadows point away from the Sun.)

Drop a small object somewhere and ask

Where is your shadow?

Can you move your shadow so that the shadow of your hand can cover the little object on the ground?

How did you know where to put your hands? (The sunlight is in straight lines to their hands and by lining themselves up with the Sun and the object; they can cast a shadow on it.)

In the class, the teacher can demonstrate by a light source

The length of the shadow cast by an object depends on the height of the tilted light source and the size of the object it is illuminating.

UNIT 4

Addition

Review of addition facts

The sum of any two one-digit numbers is called an **addition fact**. We can add two one-digit numbers by any of the following methods:

1. Using objects say sticks. For example, to add 4 and 3,set aside 4 sticks and 3 sticks in two separate heaps then combine the two heaps and count all the sticks. The count would be 7. Therefore 4 + 3 = 7.
2. Drawing objects say lines. For example to add 3 and 4, draw 3 lines - | | | and 4 lines - | | | | and count all the lines. The count would be 7. Therefore 3 + 4 = 7.
3. Counting forward from one number as many numbers in order as the second number. The last number gives the sum. For example, to add 4 and 2, we count forward 2 numbers 5 and 6. As the last number is 6, therefore 4 + 2 = 6.
   Verify
   2 + 1 = 1 + 2 = 3
   3 + 2 = 2 + 3 = 5
   4 + 2 = 2 + 4 = 6
   4 + 7 = 7 + 4 = 11
   Which shows that the order of numbers in addition does not matter.
   Thus, we may count forward from the larger number as many numbers in order as the smaller number. The last number gives the sum. For example, to add 2 and 6, instead of counting forward 6 numbers from 2-3, 4, 5, 6, 7, and 8 we can count forward 2 numbers from 6-7 and 8.
4. Using a table of addition facts given on the next page.
   The first row represents the column numbers.
   The first column represents the row numbers.
   The second row and column represents the sums 0 + 0, 0 + 1, 0 + 2, 0 + 3 and so on.
   The sixth row and column represents the sums 6 + 0, 6 + 1, 6 + 2, 6 + 3 and so on.
   To find the sum of two numbers 6 + 8, shade column number 6, and row number 8. Find the number in the cell Where the shaded row and column cross, it gives the sum,
   As the highlighted column and row meet in the cell which has 14 in it, 6 + 8 = 14.

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

Memorizing addition facts.
Memorizing addition facts is very important for further learning. The students should acquire the automaticity of these.
This is aided by generalizations:
Any number + 0 = the number.
Any number + 1 = the number that comes just after it.
The sum of two numbers in any order is the same. For example if we remember 6 + 3 = 9, then 3 + 6 is the same as 6 + 3, therefore 3 + 6 = 9.
Thus you need to memorise only the facts coloured blue.

Table of addition facts

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

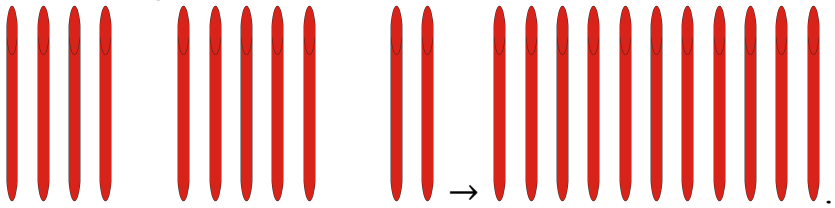
Addition facts also enable us to add tens to tens and hundreds to hundreds. That is 2 tens + 3 tens = 5 tens, 3 hundreds + 4 hundreds = 7 hundreds. This together with the concept of place value facilitates adding very large numbers very quickly.

Do the mastery test given in Appendix 2. Mark a × for the facts that you cannot recall immediately. Memorise the facts that you could not call immediately.

Addition of three one-digit numbers

Addition of three numbers may be interpreted as the number of objects obtained by combining three groups of objects. The number of objects in the combined group gives the sum of three numbers. For example if we have 3 heaps of 4 sticks, 5 sticks and 2 sticks. If we combine them we would have 11 sticks in the combined heap.

Combining



4 + 5 + 2 = 11

Verify

4 + 3 + 2 = 4 + 2 +3 = 9

7 + 6 + 3 = 7 + 3 + 6 = 16

5 + 2 + 8 = 8 + 2 + 5 = 15.

Thus, the numbers can be added in any order.

If the two numbers add to ten, we may add those first as adding to ten is easier.

Or we first add the two numbers which are large and then count forward as many numbers as the third number.

Example 1

Add 4 + 9 + 6

We can write it as

(4 + 6) + 9 = 10 + 9 = 19

( ) are called **parentheses** and the numbers within parentheses are to be added first.

We know that 4 + 6 = 10 and also 10 + 9 = 19.

Example 2

Add 6 +2 +7

We can write it as

(6 + 7) + 2

We know that 6 + 7 = 13 and then count forward two numbers 14, 15. The last number 15 gives the sum.

Magic squares

In a magic square all the numbers in the square across, down or diagonally add up to the same number. For example all the numbers in this square across down or diagonally add up to 12.

3	5	4
5	4	3
4	3	5

Exercise 4.1

Add

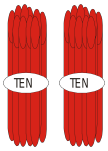
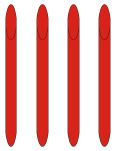
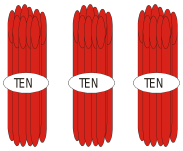
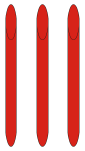
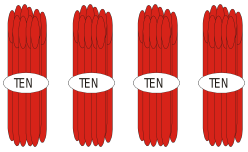
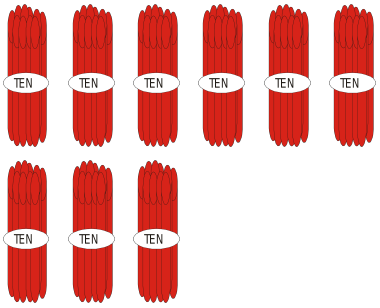
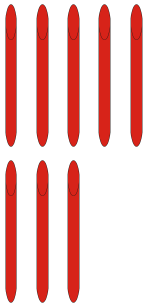
3 2 + 1 ____ ____	7 6 + 4 ____ ____	7 7 + 3 ____ ____
4 1 + 2 ____ ____	8 4 + 5 ____ ____	8 9 + 2 ____ ____
2 5 + 3 ____ ____	9 1 + 8 ____ ____	5 5 + 8 ____ ____
4 5 + 2 ____ ____	7 3 + 9 ____ ____	6 7 + 5 ____ ____
6 4 + 7 ____ ____	6 4 + 8 ____ ____	4 8 + 3 ____ ____

Use the numbers 1, 2, 3, 4, 5, 6, 7, 8 and 9 in the square given below so that they add up to number 15 along the rows, columns and across.

	9	2
3		
	1	

Addition of Two-digit Numbers that Do not Require Grouping

We can add two digit numbers by
Using bundles of ten-sticks and single sticks.
For example to add 24, 33 and 41, we can set aside 2 bundle of ten sticks and 4 sticks for 24 sticks, 3 bundle of ten sticks and 3 sticks for 33 sticks and 4 bundles of ten sticks and 1 stick for 41 sticks combine the sticks and count the bundles of ten sticks and single sticks in the combined group and find the number.

Numbers	Tens	Ones	Tens	Ones
24			2	4
33			3	3
+41			4	1
=			9	8

Expressing the numbers in expanded form and add the tens and ones

24 = 2 Tens + 4 Ones
33 = 3 Tens + 3 Ones
+ 41 = 4 Tens + 1 One
= 9 Tens + 8 Ones = 98.

The combined group has 9 tens and 8 ones, which is equal to 98.
Therefore 24 + 33 + 41 = 98.

Short Form

Write the numbers in a column aligning the ones with ones and tens with tens of the numbers. Add the ones and tens remembering that the digits on the right represent ones and those on the left represent the tens.

```
  TO
  2 4
  3 3
 +4 1
 ------
  9 8
 ------
```

Addition of two-digit and one-digit numbers

You can count forward from a two-digit number as many numbers as one-digit number. For example, to add 3 to 65 count forward three numbers-66, 67 and 68, as the last number is 68, 65 + 3 = 68.

You can also write the expanded form of two numbers writing 0 for tens for a one-digit number and add the tens and ones. For example,

65 = 6 tens + 5 ones

3 = 0 tens + 3 ones

---

6 tens + 8 ones = 68.

You may also use the short form.

Write the numbers in a column aligning the ones of the two numbers for example, to find 35 + 4, write 4 below 35, aligning 4 with 5 of 35. Add the ones and write tens to the left of that

```
  TO
  3 5
 + 4
------
  3 9
------
```

Exercise 4.2

1. Set aside the following number of sticks using bundles of ten sticks and single sticks, combine the two groups and find the number of sticks in the combined group:

   24 and 35

   42 and 53

   65 and 23

   23, 14, 31

   45, 32, 22

   32, 42, 13

   50, 28, 11

2. Add the following numbers by first writing the numbers in expanded form and then adding the ones and tens:

   13 =___tens +___ ones

   +44 =___tens +___ ones

   ___tens +___ ones = _____
   ---

   54 =___tens +___ ones

   +45 =___tens +___ ones

   ___tens +___ ones = _____
   ---

33 =___tens +___ ones

+56 =___tens +___ ones

___tens +___ ones = _____

---

22 =___tens +___ ones

13 =___tens +___ ones

+54 =___tens +___ ones

___tens +___ ones = _____

45=___tens +___ ones

12=___tens +___ ones

+40=___tens +___ ones

___tens +___ ones = _____

52=___tens +___ ones

20=___tens +___ ones

+23=___tens +___ ones

___tens +___ ones = _____

Exercise 4.3

1. Add the numbers given below mentally:
   (a) 20 + 40 = 2 tens + 4 tens = 6 tens = 60.

   (b) 30 + 20 =

   (c) 40 + 50 =

   (d) 40 + 7 =

   (e) 34 + 5 =

   (f) 45 + 3 =

   (g) 56 + 4

2. Add

T O	T O	T O
5 3	6 4	5 4
+4 5	+3 5	+3 5
------	------	------
------	------	------
6 4	2 3	5 0
+2 4	+3 4	+2 4
------	------	------
------	------	------
7 2	5 3	6 0
+1 6	+2 6	+3 0
------	------	------
------	------	------
7 6	2 3	4 7
+2 3	+4 3	+ 0
------	------	------
------	------	------

T O	T O	T O
3 3	3 0	1 2
2	3 9	4 1
+1 3	+2 0	+ 6
------	------	------
------	------	------
4 1	4 3	3 3
2 3	2 2	2 2
+3 2	+2 3	3 1
------	------	------
------	------	------
4 6	5 4	4 5
4 3	1 1	1 3
+1 0	+3 3	+2 1
------	------	------
------	------	------
5 2	4 5	7 5
2 4	1 2	2
+ 2	+3 2	+2 2
------	------	------
------	------	------

Addition of Two Digit Numbers that requires grouping

Using sticks:

1. Set aside separately as many sticks as the two numbers using ten-sticks and one-sticks.
2. Combine the one-sticks and ten-sticks with the one-sticks and ten-sticks with ten sticks.
3. Count the number of one-sticks in the combined group.
4. If the sum of one-sticks is less than ten, count the number of bundles of ten-sticks. Find the number represented by the ten-sticks and one-sticks.
5. If the sum of ten sticks is ten or more than ten, make a bundle of 10 sticks and add that to the bundles of ten-sticks.
6. Count the number of bundles of ten sticks and left over single sticks.
7. Write the number that it represents.

   Example 1

   Add 45 and 37.

   To add 45 and 37, we set aside 4 ten-sticks and 5 one-sticks for 45 sticks (row 1 on next page) and 3 ten-sticks and 7 one-sticks sticks for 37 sticks (row 2).

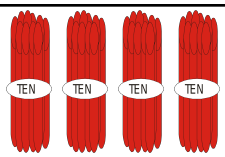
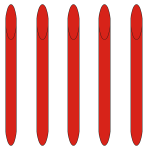
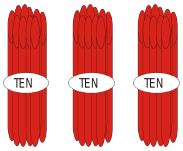
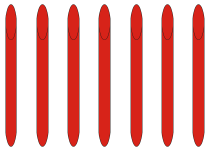
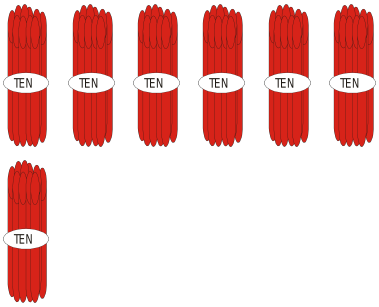
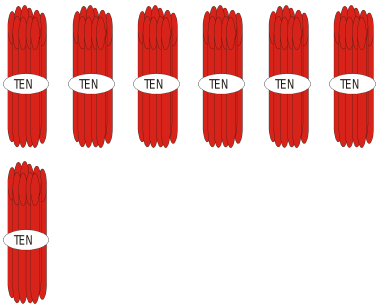
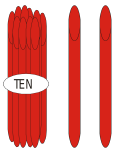
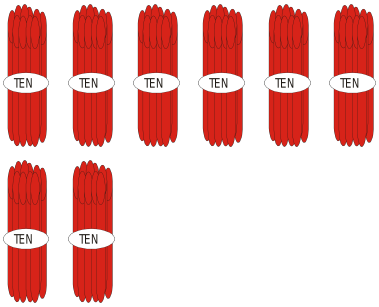
   Combine the one-sticks and ten-sticks (row 3) and count the one-sticks in the combined group.

   As there are 12 one-sticks in the combined group, we make a bundle of 10 sticks and two sticks are left over (row 4).

   We combine the bundle of 10 sticks with bundles of ten-sticks to have 8 bundles of 10-sticks. (row 5).

   Thus we would have 8 ten-sticks and 2 one-sticks (row 5), which is the same as 82 sticks.

   Therefore 45 + 37 = 82.

Number	Ten-sticks	One-sticks	Tens	Ones
45			4	5
+37			3	7
=			7	12
=				
= 82			8	2

Use expanded form

1. Express the numbers in tens and ones.
2. Add the ones to ones and tens to tens.
3. If the number of ones is 10 or more, regroup ones to tens and ones.
4. Add the ten to the sum of tens.

Example 2

Add 36 and 57.

We can write

36 = 3 Tens + 6 Ones

+ 57 = 5 Tens + 7 Ones

= 8 Tens + 13 Ones

= 8 tens + 1 ten +3 ones

= 9 tens + 3 ones

= 93

Short form

Write the numbers in a column so that ones place and tens place of two numbers are aligned.

1. Add the ones.
2. If the number of ones is 10 or more, regroup ones as tens and ones. Write ones in one's place and tens in the ten's place above the numbers to remind you that these are to be added while adding the tens.
3. Add the tens.

Example 3

Add 35 and 45.

To add 35 to 45 we write the numbers so that one's and ten's places of the two numbers are aligned.

Then add the ones, as there are 10 ones, ten ones are grouped into one ten and 0 ones. Zero is written in one's place and 1-ten is written above in the ten's place.

Then adding the tens gives 8 tens

```
 TO
  1
  3 5
+4 5
------
  8 0
------
```

Addition of two-digit and one-digit numbers

1. We can count forward from a two-digit number as many numbers as one-digit number. For example, to add 7 to 55 count forward seven numbers-56, 57, 58, 59, 60, 61 and 62, as the last number is 62, 55 + 7 = 62.
2. We can also write the expanded form of two-digit number writing 0 tens for a one-digit number and add.
   Example 4
   55 = 5 tens + 5 ones
   7 = 0 tens + 7 ones

   = 5 tens + 12 ones = 5 tens + 1 ten + 2 ones = 6 tens + 2 ones = 62.

3. We may also use the short form; remembering to align one-digit number with one's place of the two-digit number.
   Example 5
   T O
   1
   55
   + 7

   62

Exercise 4.4

1. Set aside the number of one-sticks given below. Combine as many one-sticks in ten-sticks as you can and write the number of ten-sticks and one-sticks you have.

   15 sticks = _____ten-sticks + _____ single sticks

   56 sticks = _____ten-sticks + _____ single sticks

   43 sticks = _____ten-sticks + _____ single sticks

   20 sticks = _____ten-sticks + _____ single sticks

   7 sticks = _____ten-sticks + _____ single sticks

2. Set aside the following number of sticks using ten-sticks and one-sticks. Combine the two groups and find the number of sticks in the combined group:

   (a) 17 and 25

   (b) 24 and 39

   (c) 45 and 32

   (d) 47, 37, and 14

   (e) 26, 28, and 36

   (f) 38, 44, and 10

   (g) 34 and 9

   (h) 45, 34, and14

   (i) 50, 20, and 17

Exercise 4.5

Add the following numbers by first writing the numbers in expanded form and adding the ones to ones and tens to tens:

1. 17=___tens +___ ones
   +54=___tens +___ ones

   ___tens +___ ones = ___tens + ___tens +___ ones =_____
   ---

2. 35=___tens +___ ones
   +48=___tens +___ ones

   ___tens +___ ones = ___tens + ___tens +___ ones =_____
   ---

3. 47=___tens +___ ones
   +29=___tens +___ ones

   ___tens +___ ones = ___tens + ___tens +___ ones =_____
   ---

4. 67=___tens +___ ones
   +28=___tens +___ ones

   ___tens +___ ones = ___tens + ___tens +___ ones =_____
   ---

5. 45=___tens +___ ones
   +14=___tens +___ ones

   ___tens +___ ones = ___tens + ___tens +___ ones =_____

   18=___tens +___ ones
   +29=___tens +___ ones

   ___tens +___ ones = ___tens + ___tens +___ ones=

Exercise 4.6

Add

T O	T O	T O
2 3 +4 8 ------	3 7 +2 6 ------	4 8 +2 6 ------
------	------	------
3 8 +2 4 ------	1 5 +2 7 ------	7 6 + 5 ------
------	------	------
3 9 +4 5 ------	4 5 +3 7 ------	4 6 +3 9 ------
------	------	------
6 3 +2 8 ------	3 7 +4 8 ------	5 7 +2 9 ------
------	------	------
5 5 +4 7 ------	8 2 +1 8 ------	7 6 +2 3 ------
------	------	------

T O	T O	T O
6 7 +2 9 ------ ------	4 6 +3 2 ------ ------	6 9 + 2 1 ------ ------
7 8 +1 9 ------ ------	1 7 +4 2 ------ ------	7 4 + 2 3 ------ ------
3 5 2 7 +2 5 ------ ------	1 7 4 3 +2 7 ------ ------	2 5 4 4 +1 8 ------ ------
4 6 1 4 +3 5 ------ ------	6 8 1 2 +1 7 ------ ------	5 3 1 4 +2 7 ------ ------
2 3 2 7 +4 6 ------ ------	3 9 1 3 +4 7 ------ ------	5 0 2 6 37 ------ ------

Exercise 4.7

1. There are 20 boys and 17 girls in a class. How many children are there in the class?

2. Anuj had 18 rupees and his mother gave him 25 rupees. How much money does he have now?

3. Bakul bought one book costing 27 rupees and another book costing 38 rupees. How much money did he spend in all?

4. There were 34 children in a class, 6 more children were admitted in the new session. How many children are there in the class now?

5. There were 45 mango trees and 27 more mango trees were planted in a garden. How many mango trees are there now?

6. Raman has 12 coloured pencils and 5 black pencils. How many pencils does he have in all?

7. Ranjana bought a book costing 58 rupees, a pen costing 12 rupees and a pencil costing 3 rupees. How much money did she spend in all?

8. Rajan ran 400 metres on Saturday and 200 metres on Sunday. How many metres did he run in all?

9. You have 50 rupees and want to buy a bat costing 40 rupees and a ball costing 13 rupees. Do you have enough money to buy them?

10. Give situations in which you will need to add.

UNIT 4

Subtraction

Subtraction facts

Subtraction of two numbers that correspond to addition of one digit numbers is called a **Subtraction fact**.
We can subtract numbers by

1. **Use of sticks**
   To subtract 3 from 6, we set aside 6 sticks, take away 3 from these. The count of 3 of the remaining ones gives the difference. Therefore 6 – 3 = 3.
2. **Use of drawings of objects**
   To subtract 3 from 6; draw 6 lines | | | | | |, then strike off 3 lines | | | ~~\|\|\|~~ and count the remaining ones-3, the count of those gives the difference. Therefore 6 – 3 = 3.
3. **Matching objects or drawings**
   Set aside two collections of 6 objects and 3 objects. Match the objects in two collections and count the objects that are left over in the larger collection. As 3 objects are left over in the collection with 6 objects, the larger collection has 3 more objects or
   6 – 3 = 3
4. **Counting back** as many numbers as the number to be subtracted, the last number gives the difference. For example, to subtract 3 from 6 we count back 3 numbers from 6 in order 5, 4, 3. The last number 3 gives the difference.
5. **Use of addition table**- as subtraction facts are related to addition facts, for example, if 7 + 5 = 12, 12 – 5 = 7. Therefore to find 12 – 5, we highlight the row with 5 in the row heading and find 12 in that row and read the number at the top of the column, which is 7 and gives the difference of 12 and 5, therefore 12 – 5 = 7.

Table of addition facts

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

Memorizing subtraction facts.
This is very important for further learning. Students should acquire the automaticity of these.
This can be aided by some generalizations. Subtracting 0 from any number gives the number.
Subtracting 1 from any number gives the number that comes just before it.
Learning related addition and subtraction facts together(Fact families).

Fact families

The addition and subtraction facts that use the same three numbers make up a fact family, e.g. the fact family for numbers 5, 8 and 13 is

$5 + 8 = 13$, $8 + 5 = 13$, $13 - 8 = 5$ $13 - 5 = 8$

Fact families help us to learn addition and subtraction facts faster.

Checking subtraction

Addition can be used to check whether your subtraction was right.

You can check if $12 - 5 = 7$ is correct by adding the answer 7, to the number that was subtracted, that is 5. If the answer is 12 the number from which it was subtracted it is right otherwise wrong.

Mastery Test on Subtraction facts

Do the mastery test given in Appendix 3. Mark a ✕ for the facts that you cannot recall immediately. Memorise them.

Exercise 5.1

Subtract

1. **7** – 4 =
2. 8 – 3 =
3. 10 – 5 =
4. 12 – 7 =
5. 15 – 7 =
6. 17 – 8 =
7. 16 – 9 =
8. 18 – 9 =
9. 13 – 7 =
10. 12 – 6 =
11. 14 – 8 =
12. 15 – 9 =
13. 17 – 9 =
14. 16 – 8 =
15. 14 – 7 =

Exercise 5.2

Write fact families for the numbers given below:

1. 3, 5 and 8
   3 + 5 = 8, 5 + 3 = 8, 8 – 3 = 5, 8 –5 = 3
2. 4, 5 and 9

3. 7, 2 and 9

4. 6, 5,and 11

5. 8, 9 and 17

6. 9, 9 and 18

Home assignment

Throw the number of coins of the same denomination twice and record the results in the table given below:

Number of coins	Number of heads	Number of tails	Addition statement
6			
6			
10			
10			
7			
7			

Add number of heads and tails and write these as addition statements e.g. 6 + 4= 10.
Hide the number of heads. Can you find the number of tails? If yes, find them and check them.

Exercise 5.3

Solve the following problems mentally:

1. Rita had 10 sweets she gave 3 to her brother. How many sweets does she have now?

2. Annu had 6 bangles, 2 got broken. How many bangles does she have now?

3. Runa had 10 rupees her mother gave her 5 rupees. How many rupees does she have now?

4. Gaurav has 5 rupees and he wants to buy a book costing 11 rupees. How many more rupees does he need?

5. Sunita has 8 frocks and Sushma has 6 frocks. Who has more frocks and how many more?

6. There were 12 children in a group dance. If there were 7 girls in the dance. How many boys were there?

7. Vimal has 6 toys and his brother has 7 toys. How many toys do they have in all?

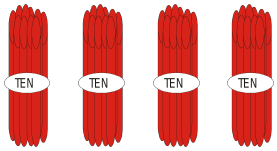
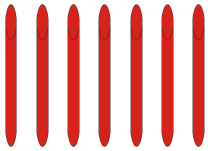
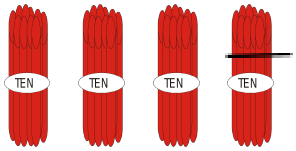
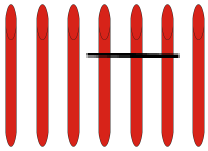
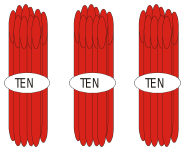
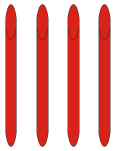
8. Rita had 14 rupees and she gave 5 rupees to her brother. How many rupees does she have now?

9. There are 7 girls and 16 boys in a class. Are there more girls or boys and how many more?

10. Babita had 12 pencils; she lost three of those. How many pencils does she have now?

Subtraction of two-digit numbers that do not require grouping

1. **Use of sticks**
   We can subtract two digit numbers by using sticks. For example, to subtract 13 from 47, we set aside 4 bundles of ten sticks and 7 single sticks for 47 and remove 1 bundle of ten sticks and 3 single sticks for 13 from these and count the remaining ones.

	Tens	Ones
Set aside 47 sticks		
Remove 1 bundle of ten sticks and 3 single sticks		
Count the remaining sticks = 34 sticks.		

Therefore 47 – 13 = 34

2. **Express numbers in expanded form**
   Write the numbers in terms of tens and ones.
   Subtract the ones from ones and tens from tens.
   47 = 4 Tens + 7 Ones
   –12 = 1 Ten + 3 Ones

   = 3 Tens + 4 Ones

   That is the same as 34.

3. **Short form**
   Align the digits in tens and ones place of the number to be subtracted under the tens and ones place of the other number. You may write T for Tens and O for Ones above the numbers. Subtract ones from ones and tens from tens.

```
  T O
  3 5
- 1 2
-----
  2 3
```

Exercise 5.4

Subtract the following by using bundles of ten sticks and single sticks:

1. 2 4 - 1 3 = _____
2. 3 5 - 2 3 = _____
3. 4 9 - 2 4 = _____
4. 6 7 - 4 0 = _____
5. 7 5 - 3 5 = _____
6. 5 0 - 2 0 = _____
7. 7 5 - 44 = _____
8. 8 7 - 3 5 = _____
9. 9 8 - 6 3 = _____
10. 4 5 - 3 3 = _____
11. 6 9 - 48 = _____
12. 100 - 60 = _____
13. 7 6 - 6 = _____
14. 8 9 - 4 = _____
15. 7 6 - 5 = _____

Exercise 5.5

Subtract the following by first expressing the numbers as tens and ones and subtracting the ones from ones and tens from tens:

1. 47 = ___ Tens + ___ Ones
   -32 = ___ Tens + ___ Ones

   ___ Tens + ___ Ones = ____
   ---

2. 26 = ___ Tens + ___ Ones
   -14 = ___ Tens + ___ Ones

   ___ Tens + ___ Ones = ____
   ---

3. 83 = ___ Tens + ___ Ones
   -63 = ___ Tens + ___ Ones

   ___ Tens + ___ Ones = ____
   ---

4. 54 = ___ Tens + ___ Ones
   -22 = ___ Tens + ___ Ones

   = ___ Tens + ___ Ones = _____
   ---

5. 69 = ___ Tens + ___ Ones
   - 47 = ___ Tens + ___ Ones

   = ___ Tens + ___ Ones = _____
   ---

6. 89 = ___ Tens + ___ Ones
   44= ___ Tens + ___ Ones

   = ___ Tens + ___ Ones = _____

Exercise 5.6

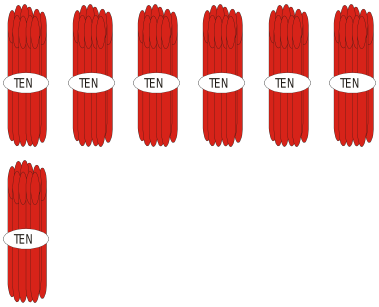
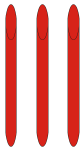
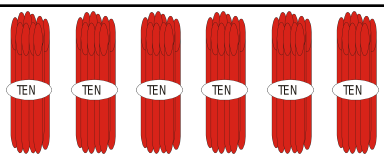
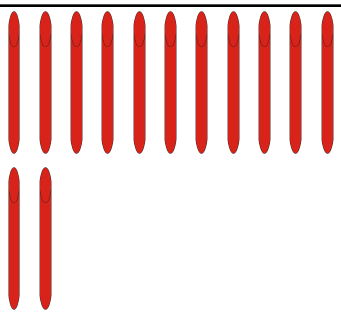
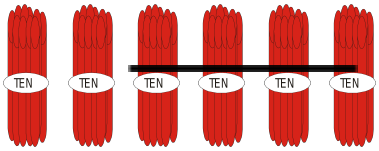
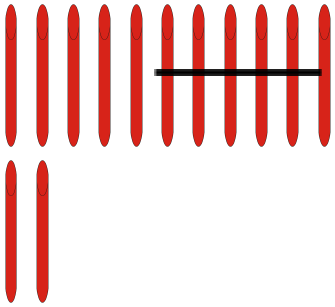
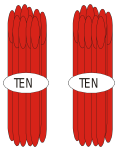
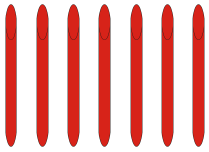
Subtract:

T O	T O	T O
3 9	5 5	3 8
- 2 4	- 1 3	- 4
------	--------	--------
------	--------	--------
5 8	3 8	5 5
- 1 4	- 2 3	- 3
------	--------	--------
------	--------	--------
4 7	8 5	9 9
- 2 2	- 3 2	- 6 6
------	--------	--------
------	--------	--------
2 7	7 9	1 7
- 2 0	- 1 6	- 7
------	--------	--------
------	--------	--------
4 8	4 6	8 9
- 5	- 4 3	- 2 8
------	--------	--------
------	--------	--------

Subtraction of two-digit numbers that requires grouping

Use of sticks

1. Set aside as many sticks as the number from which a number is to be subtracted using ten-sticks and one-sticks.
2. Find the number of ten-sticks and one-sticks in the number to be subtracted.
3. If the number of one-sticks to be removed is less than the number of one-sticks set aside. Remove them.
   If the number of one-sticks to be removed is more than the number of one-sticks set aside. Then open a bundle of 10 sticks and combine those sticks to single sticks. Then remove as many sticks as the number of ones.
4. Remove as many ten-sticks as in the number to be subtracted from the ten sticks that are left after opening one bundle of ten-sticks.
   For example, to subtract 47 from 73,
   We set aside 7 bundles of ten-sticks and 3 single sticks for 73 sticks (row 1).
   As there are 3 one-sticks, and we have to remove 7 sticks, we take 1 bundle of ten-stick from 7 ten-sticks and combine that with 3 one-sticks. We now have 6 ten-sticks and 13 one-sticks (row 2).
   We now remove 4 ten-sticks and 6 one-sticks from these (row 3).
   That leaves 2 ten-sticks and 7 one-sticks that is the same as 27 sticks (row 4).
   Therefore 73 – 46 = 27.

Number	Ten-sticks	One-sticks
Set aside 73 sticks		
Open 1 bundle of ten-sticks and combine that with one-sticks		
Remove 4 ten-sticks and 6 one-sticks		
Count the left over sticks-27.		

Expressing numbers in expanded form

1. Express the numbers in expanded form.
2. If the number of ones to be subtracted is less than the number of ones in the number from which it is to be subtracted, subtract them.
   If the number of ones to be subtracted is more than the number of ones in the number from which it is to be subtracted, exchange one ten with 10 ones and add that to ones and correct the number of tens. Then subtract the ones from ones.
3. Subtract tens from tens.
   For example to subtract 46 from 73, we express 73 in expanded form
   73 = 7 tens + 3 ones

As we have to subtract 7 ones and there are only 3 ones, we take away 1 ten from 7 tens and rename that as ten ones and add that to 3 ones. So we now have 6 tens and 13 ones and we can now subtract 4 tens and 6 ones from these by subtracting tens from tens and ones from ones.

73 = 7 tens + 3 ones = 6 tens + 13 ones
–46 = 4 tens + 7 ones = 4 tens + 6 ones

= 2 tens + 7 ones = 27.

Use of short form

1. Write the numbers aligning ones and tens of the two numbers.
2. We may write T for tens and O for ones above the numbers.
3. If the number of ones to be subtracted is less than the number of ones in the number from which it is to be subtracted, subtract them.
   If the number of ones to be subtracted is more than the number of ones in the number from which it is to be subtracted, exchange one ten with 10 ones and correct tens and write 1 before ones and above it to remind us that we have ten + number of ones for ones. Then subtract the ones from ones
4. Subtract tens from tens.
   For example, to subtract 46 and 73, write 73 and 46 below that and align the ones and tens.
   As the number of ones to be subtracted is more than 3, we exchange 1 ten with ten ones and correct the tens and ones by striking off 7 and writing 6 and writing 1 before 3 and above it to remind us that we now have 6 tens and 13 ones
   We now subtract ones from ones and tens from tens.

   T O
   61
   ~~7~~ 3
   -4 6
   ---
   2 7

Exercise 5.7

Subtract the following by using ten-sticks and one-sticks:

1. 4 2 - 1 4
2. 4 3 - 2 5
3. 4 9 - 2 4
4. 7 5 - 0
5. 6 3 - 2 8
6. 1 2 - 8
7. 9 1 - 3 6
8. 8 2 - 4 5
9. 7 2 - 2 3
10. 8 4 -1 5
11. 7 3 - 2 5
12. 2 2 - 4
13. 6 3 - 4 8
14. 34 - 9
15. 40 - 0
16. 60 - 30
17. 50 - 46

Exercise 5.8

Subtract the following by expressing the numbers as tens and ones and renaming one ten as ten ones if necessary and subtracting the ones from ones and tens from tens:

1. 42= 4 Tens + 2 Ones = 3 Tens + 12 Ones
   -17= 1 Ten + 7 Ones = 1 Ten + 7 Ones

   = 2 Tens + 5 Ones = 25
   ---

2. 41= ___ Tens + ___ Ones = ___ Tens + ___ Ones
   -17= ___ Ten + ___ Ones = ___ Ten + ___ Ones

   = ___ Tens + ___ Ones =
   ---
3. 28 =___ Tens + ___ Ones = ___ Tens + ___ Ones
   -17= ___ Ten + ___ Ones = ___ Ten + ___ Ones

   = ___ Tens + ___ Ones =
   ---
4. 82 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
   -36= ___ Ten + ___ Ones = ___ Ten + ___ Ones

   = ___ Tens + ___ Ones =
   ---
5. 45 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
   19= ___ Ten + ___ Ones = ___ Ten + ___ Ones

   = ___ Tens + ___ Ones =
   ---
6. 66 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
   -27 = ___ Ten + ___ Ones = ___ Ten + ___ Ones

   = ___ Tens + ___ Ones =
   ---

7. 71 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
-27 = ___ Ten + ___ Ones = ___ Ten + ___ Ones

= ___ Tens + ___ Ones =
---

8. 74 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
-47= ___ Ten + ___ Ones = ___ Ten + ___ Ones

= ___ Tens + ___ Ones =
---

9. 32 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
-24= ___ Ten + ___ Ones = ___ Ten + ___ Ones

= ___ Tens + ___ Ones =
---

10. 56 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
-29= ___ Ten + ___ Ones = ___ Ten + ___ Ones

= ___ Tens + ___ Ones =
---

11. 35 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
-17= ___ Ten + ___ Ones = ___ Ten + ___ Ones

= ___ Tens + ___ Ones =
---

12. 44 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
-27 = ___ Ten + ___ Ones = ___ Ten + ___ Ones

= ___ Tens + ___ Ones =
---

13. 57 = ___ Tens + ___ Ones = ___ Tens + ___ Ones
-19 = ___ Ten + ___ Ones = ___ Ten + ___ Ones

= ___ Tens + ___ Ones =

Exercise 5.9

Subtract:

T O	T O	TO
3 9 - 2 4 -------	7 3 - 1 6 --------	4 7 -1 9 --------
-------	--------	--------
5 4 - 1 8 -------	8 4 - 3 6 --------	3 5 - 2 6 --------
-------	--------	--------
4 2 - 2 7 -------	9 8 - 6 9 --------	8 2 - 3 5 --------
-------	--------	--------
2 5 - 1 8 -------	1 7 - 1 7 --------	3 7 - 2 8 --------
-------	--------	--------
4 6 - 2 8 -------	6 6 - 2 9 --------	70 -70 -------
-------	--------	-------

Exercise 5.10

1. There are 45 children in a class. If there are 26 girls, how many boys are there?

2. A man bought a book costing 25 rupees. If he gave a fifty-rupee note to the shopkeeper. How much money the shopkeeper would return to him.

3. Raman has 42 rupees and Suman has 23 rupees. Who has more money and how much more?

4. Eighteen girls and 24 boys went for a picnic. Were there more girls or boys and how many more?

5. Sarah bought two packets of toffees containing 46 and 49 toffees to give to her classmates on her birthday.
   How many toffees does she have?

   She distributed 88 of those. How many toffees does she have now?

6. Give situations in which you will need to subtract.

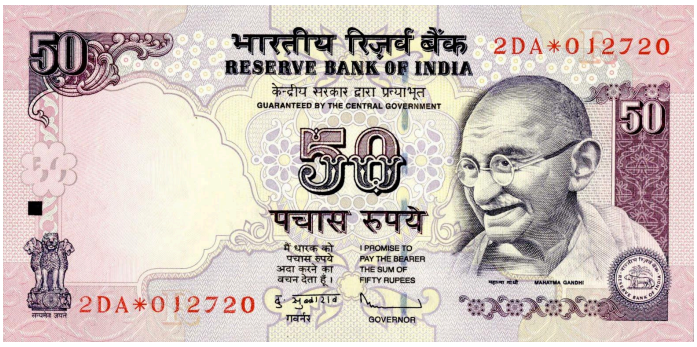
7. Would 60 - 48 be less than or more than 10?

8. Would 23 + 40 be more than or less than 60?

UNIT 6

Money

We use the money for buying things, paying bus fare, paying school fees among other uses. Indian money is in **rupees**. The worth of a note or coin is called its **denomination.** Currency of denomination of rupees 1, 2, 5, and 10 is available in notes as well as coins. The coins and notes of various denominations up to rupees one hundred are given below:



Finding the worth of many notes of the same denominations

If we have many notes of the same denomination, we can find the amount of money we have by counting by the amount of denomination as many times as the number of notes we have. The last number gives the amount of money we have.

For example, if we have 6 ten-rupee notes, we can count 6 numbers by ten-10, 20, 30, 40, 50 and 60. As the last number is 60, we have 60 rupees.
Similarly if we have 5 five-rupee notes. We count 5 numbers by five-5, 10, 15, 20 and 25. As the last number is 25, we have 25 rupees.
Similarly if we have 7 two-rupee notes, we count 7 numbers by two-2, 4, 6, 8, 10, 12, and 14. As the last number is 14, we have 14 rupees.

Finding the worth of many notes of different denominations

If there are several notes of different denominations we can find the amount of money by first finding the worth of notes of the same denomination separately and then adding them.
For example, if we have 6 ten-rupee notes and 5 five-rupee notes, we first find the worth of 6 ten-rupee notes which is equal to 60 rupees, then the worth of 5 five-rupee notes which is equal to 25 rupees and then add them. As 60 + 25 = 85, therefore the total amount of money is equal to 85 rupees.

Paise

We used to have coins of smaller denominations called paise.However, now they are not minted. But the prices of things of daily use can involve paise e.g. the price of patrol. In such cases, we need to round the total amount to the nearest rupee.

1 rupee = 100 paise

Rounding of paise to nearest rupee.

If the number of paise is greater or equal to 50 paise, we pay a rupee for it. For example, if our total amount is 47 rupees and 70 paise, we will pay 48 rupees.
If the number of paise is less than 50, we do not have to pay the paise.
For example, if our total amount is 77 rupees and 40 paise, we will pay 77 rupees only.

Exercise 6

1. If you have the set of notes given below, how much money would you have?

   (a) 8 one-rupee notes

   (b) 5 two-rupee notes

   (c) 6 five-rupee notes

   (d) 8 ten-rupee-notes

   (e) 4 ten-rupee-notes and 7 one-rupee notes

   (f) 2 ten-rupee notes and 5 one-rupee notes

   (g) 2 ten-rupee-notes,1 five-rupee note and 3 one-rupee notes

2. How many one-rupee notes can you get for a two-rupee note?

3. How many ten-rupee notes can you get for a hundred-rupee note?

4. How many paise does a rupee have?

5. Rani has coins worth 17 rupees in her purse. What combination of notes or coins can she have? (There are many correct answers.)

6. Anuj has 45 rupees. What combination of notes of different denominations can he have? (There are many correct answers.)

7. You bought a lollipop worth 3 rupees and a chocolate worth 15 rupees. How much money would you have to pay to the shopkeeper?

8. You bought a toy worth 56 rupees and gave 60 rupees to the shopkeeper. How much money should the shopkeeper return to you?

9. You bought a notebook worth 6 rupees and a book worth 42 rupees. How much money would you have to pay to the shopkeeper?

10. You had 50 rupees in the bank, you deposited 35 rupees more. How much money do you have in the bank now?

11. Round the following to the nearest rupee:
    (a) 23 rupees and 68 paise

    (b) 48 rupees and 20 paise

    (c) 80 rupees and 50 paise

    (d) 59 rupees and 87 paise

UNIT 7

Measurement

Length

Watch the video: https://youtu.be/FrQqkwdAK2M

Ordering objects in order of length

Take out a pencil, a pen, and a crayon from your school bag and tell

1. Which of these is the shortest?
2. Which of these is the longest?
3. Are any two of these about the same length?
4. If you arrange these objects in order of length from smallest to largest, then which objects would you place at first, second and third position?
5. If you arrange these objects in order of length from largest to smallest, then which objects would you place at first, second and third position?

Measurement of length using non standard units

1. Measure the length, width and height of your desk using your hand-span.
2. Cut a strip of paper or cardboard that is as long as your little finger, call this "pinki".
   (a) How many pinkies long is your nose?
   (b) How many pinkis long is your mathematics book?
   (c) How many chichis long is your pen?
3. If the teacher measures your desk with her hand-span, would her numbers be the same as yours?
4. Since you and the teacher are measuring the same things, why are the numbers not the same?
5. Use sticks of the same length and measure again the length, width and height of your desk, length and width of your math's book.
   If the teacher measures these by the stick of the same length, would her numbers be the same as yours now?

Thus we need measuring instruments that would give the same measure for everyone.

Height

Ordering objects in order of height

Ask 4 children to come to the front and asks others

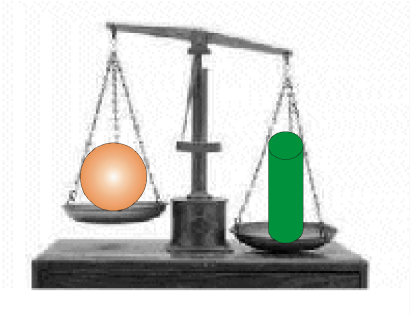
1. Who is taller child A or child B (name the two children)?
2. Who is shorter child A or child B (name the two children)?
3. Are any of these children about the same height?
4. Where would child C (name him) fit in if he and children A and B were to stand in order of height from shortest to tallest?
5. Where would child D fit in (name him)?
6. If these four children were to stand in order from shortest to tallest, name the child who should stand first, second, third, and fourth.
7. If these four children were to stand in order from tallest to shortest, name the child who should stand first, second, third, and fourth.

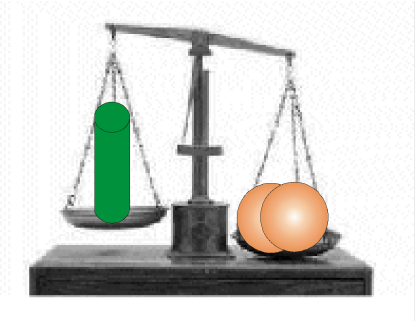
Exercise 7.1

1. Find something in the classroom that is wider than your desk.
2. Find something in the classroom that is shorter than your pencil.
3. Find some things that are about the same length.
4. Which is farther from your classroom, Principal's room or library?
5. Who is farther from the blackboard (name 2 children)?
6. Which is nearer from our school (name 2 places all the children are familiar with)?
7. Name a far away place that you have been to.
8. How can we measure the length of this room using our feet?
9. Measure and tell the length of your classroom using your feet.
10. Why do your measurements of different children differ?
11. What are some other materials or objects that we could use to measure length?
12. Arrange 4 sticks of different lengths in order.

Weight

Show the video: https://youtu.be/qUOQrXmfwDM
Ask students to take out two objects of different weight from their school bag, one in each hand and ask the student to tell which one weighs more and which one weighs less.
How did they determine which weighed more and which weighed less?
The one that weighs more is called **heavier** and the one that weighs less is called **lighter**.
You can also tell what weighs more by using a balance. The side of the balance with heavier objects goes down.



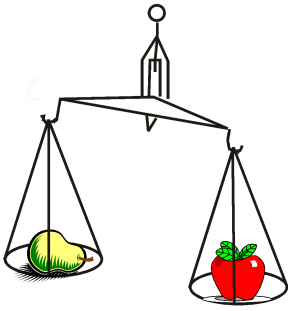


We can weigh and compare the weight of objects by using marbles of the same weight till both sides balance.
The number of marbles required for both pans to be at the same level is the weight of the object.
The object that requires more marbles is heavier.
How much one object is heavier than the other can be determined by the difference in the number of marbles. Demonstrate by weighing readily available objects.

Exercise 7.2

1. Give examples of situations that require measurement of weight.

2. Which of the following will be heavier. Encircle it.
   (a) a watermelon or mango?
   (b) a pencil or your mathematics book?
3. Which of the following will be lighter. Encircle it.
   (a) a rubber or your English book?
   (b) The teacher's table or chair?
4. Tell which of the two objects is heavier? How did you find out?



5. Tell which of the two objects is lighter? How did you find out?

6. Does the size of an object always determine how much it weighs?

7. Give examples of small objects that weigh a lot.

8. Give examples of large objects that do not weigh a lot.

9. How can we determine how much an object weighs?

10. Have you seen any other scales?

Capacity

Show the video: https://youtu.be/TkXxn0bJ4r0

Ordering objects in order of capacity

Ask children to bring empty bottles, plastic mugs etc. and ask them which of two specific containers would contain more?

Which of two specific containers would contain less?

Would any of these containers contain about the same amount of water?

The quantity of liquid a container can hold is called its **capacity**.

We can compare the capacity of two containers by filling container 1 with water and pouring it in container 2.

If the second container is full and some water is left over in the first, the first one has more capacity.

On the other hand if we can pour all the water and the second one is still not filled then the first one has less capacity.

If the second is also full and no water is left over, both have the same capacity.

We can estimate the capacity of a big container by pouring mugs of water till it fills and counting the number of mugs needed to fill it.

We can also compare the capacity of two containers by this procedure. The container that needs larger number of mugs has more capacity

Exercise 7.3

1. Arrange three containers such as a glass, a bowl and a pot in order of capacity and verify that.

2. Compare the capacity of the containers given below by writing S under the smallest, L under the largest.

3. How can we determine the capacity of any container, say a bucket using mugs?

4. Find the capacity of some bigger containers using smaller containers.

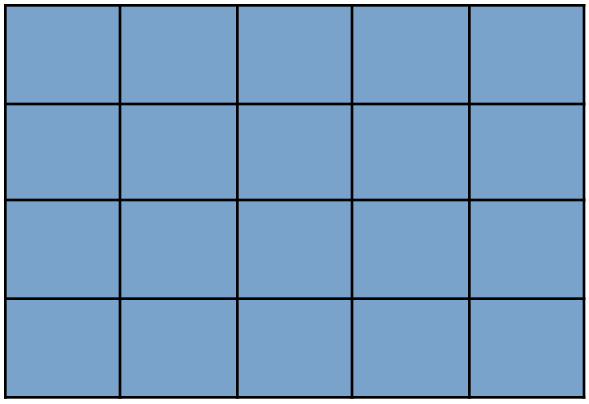
5. Estimate the capacity of some other containers in terms of a specific container and verify those.

6. Would using bowls rather than mugs to measure the capacity of a bucket give us the same answer? Why or why not?

UNIT 8

Equal Groups

There are many situations in which we need to add the same number many times.
For example, There are 6 eggs in each tray and we want to know how many eggs are there in 3 trays.
There are 6 + 6 +6 = 18 eggs.
Or a rectangular region is covered with small square tiles so there are 5 tiles in each row and there are 4 rows of tiles and we want to find out how many square tiles there are in all.



There are 5 + 5 +5 + 5 = 20 tiles.
We set aside 4 sets of two sticks or draw 2 lines 4 times and want to know how many sticks or lines there are in all.

or

| | | | | | | |

There are 2 + 2 +2 + 2 = 8 sticks.

If we have many one-digit numbers to add, it is tedious to add them, so we may use skip counting.

Use of skip counting

We can use a Hundred Table to skip count by a number to find how many will be there in a number of groups which are of the same size.

Example

To find 4 + 4 + 4 + 4 + 4 + 4

We shade every fourth number. Then count by four 6 numbers-4, 8, 12, 16, 20, 24. The last number 24 gives the sum.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Exercise 8.1

1. Count by 2.

2. Count by 3.

3. Count by 5.

4. Count by 10.

5. Highlight every sixth number beginning with 6. Count by 6.

6. How many petals are there in each flower? In all flowers?

(a)

(b)

7. Make 3 sets of 4 sticks, how many sticks did you use?

8. Make an array of counters with 4 rows and 5 columns, how many counters did you use? (If you do not have counters, draw Os.)

9. Make an array of counters with 6 rows and 3 columns, how many counters did you use?

10. A carpenter needs 4 legs to make a chair, how many legs would he need for 4 chairs?

11. Give situations in which you have to add the same numbers repeatedly.

12. Find

(a) 2 + 2 + 2+ 2 = _____

(b) 5 + 5 + 5 + 5 + 5 +5 = _____

(c) 3 + 3 + 3 + 3 + 3 = = _____

(d) 7 + 7 + 7 = _____

(e) 6 + 6 + 6 + 6 = = _____

(f) 10 + 10 +10 + 10 + 10 + 10 +10 = _____

Making equal groups of objects

Form groups of students having 2, 3, 4, 6, 12 students.
Ask each group to divide 12 sticks among them so that each student in the group has the same number of sticks.
Ask them how many sticks each student has in groups of different sizes?
Write on the blackboard, the size of the group and number of sticks that each student had in that group.
Repeat it with another number of sticks or other objects using different numbers in each group.
Give each student a specific number of sticks and ask them to give each student a certain number (a factor of that number) and ask them how many students they could give it to?
Repeat with other numbers and objects.

Exercise 8.2

1. Divide the number of sticks given below equally in as many equal groups as given against each. Write how many sticks will be there in each group?

   4 in 2 ____

   9 in 3 ____

   20 in 4 ____

   30 in 5 _____

2. Set aside the following number of sticks and form a number of groups having the number of sticks given for each. How many groups will be there?

   6 sticks that have 2 sticks in each group 3

   12 sticks that have 3 sticks in each group ____

   12 sticks that have 4 sticks in each group ____

   20 sticks that have 2 sticks in each group ____

   30 sticks that have 5 sticks in each group ____

   20 sticks that have 4 sticks in each group ____

3. If you have 12 toffees and you want to divide equally between 4 friends, how many will each have?

4. If you have 10 laddoos and you want to give 2 laddoos to everyone, how many people can you give it to?

5. Make an array of 20 counters with 4 rows, how many counters are there in each row?

6. Make an array of 24 counters with 6 rows, how many counters are there in each row?

7. If you have 12 counters and want 3 counters in each row, how many rows will there be?

8. If you have 16 counters and want 4 counters in each row, how many rows will there be?

9. If you have 16 counters and want 4 counters in each column, how many columns will there be?

10. Vivek wants to give 4 toffees to each child and there are 10 children. How many toffees does he need to buy?

11. Mita had 10 laddoos and she gave 2 ladoos to each child. How many children were there?

UNIT 9

Time

Year, Months, and Days

The time of a particular event e.g. birth, death is specified by the day, month and year.
The time it takes earth to go around the sun once is called a year.
The day Christ the founder of Christian religion was born is taken as the first day of year zero in the present numbering of years. The years before that are counted as so many years before Christ or BC. A year has 365 days and is divided into 12 months.

Month

Show the video: https://youtu.be/RvLKWuYsTyg
The names of the months and days in in a month are as follows:
January is the first month of the year and has 31 days.
February is the second month of the year and has 28 or 29 days.
March is the third month of the year and has 31 days.
April is the fourth month of the year and has 30 days.
May is the fifth month of the year and has 31 days.
June is the sixth month of the year and has 30 days.
July is the seventh month of the year and has 31 days.
August is the eighth month of the year and has 31 days.
September is the ninth month of the year and has 30 days.
October is the tenth month of the year and has 31 days.
November is the eleventh month of the year and has 30 days.
December is the twelfth month of the year and has 31 days.
Days in each month begin with 1 and increase by one till the number of days it has.
A year begins with the first day of January and ends with 31st of December.
It has 365 days and 366 every fourth year which is called a **leap** year.
A leap year has 29 days in February.
After December, January of next year would come and the other months would follow in the same order.
The poem given below will help in remembering days in different months.

Poem

Thirty days has September,

April, June and November.
All the rest have thirty-one,
Except for February alone,
which has twenty-eight days clear
and twenty-nine in each leap year**.**

Week and Days

Watch the video: https://youtu.be/pLeT1AwSpwk
A year has 52 **week**s.
A week has 7 days.
Names of the days in a week are as follows:
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Monday is taken as the first day of the week.
These days are repeated in order next week.

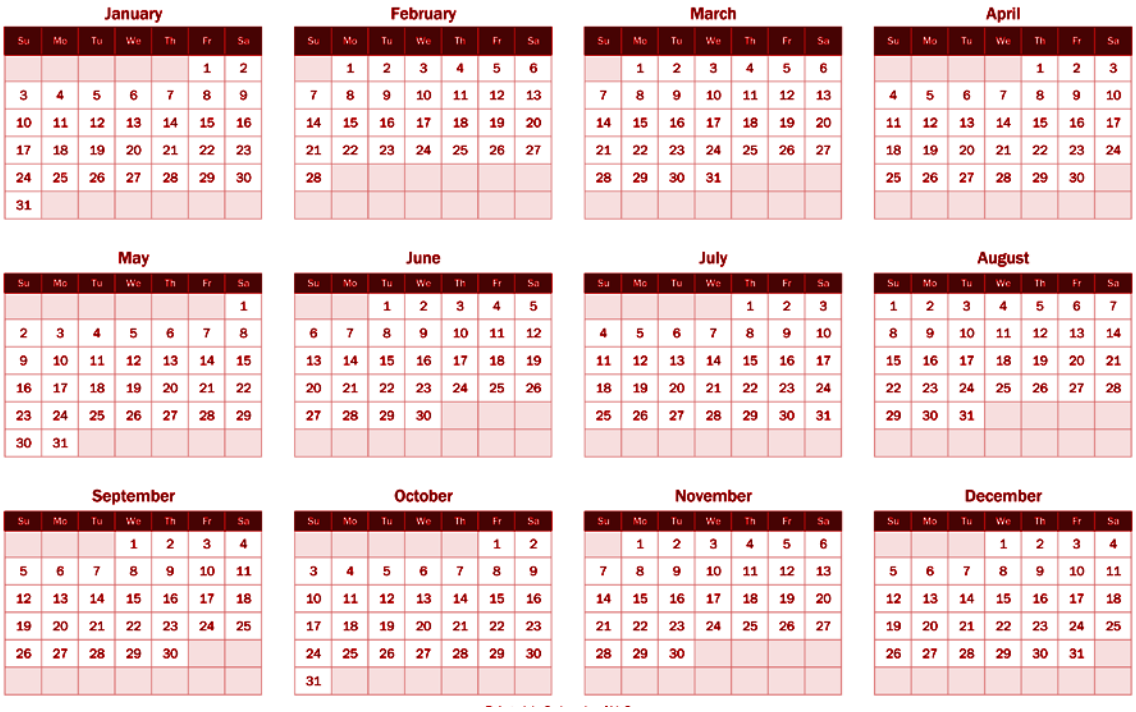
Date

A day is specified by day, month and year and is called the date. It is important to know the date when an event took place e.g. when a person was born, when a letter was written. We write a date as 7.4.2014 or 7th April, 2014, or April 7, 2014.

Calendar

A calendar shows months of a year and days in a month.
A calendar is used to find the days of the week on which a particular day would fall or the date on which the second Saturday would fall. Can you suggest some situations in which you would want to know these?
Give examples of dates of important festivals and demonstrate how to find the day of the week for these from a calendar; and the day of the month on which the first Sunday or last Saturday of a month would fall.
A calendar of the year 2021 is given below:

Calendar 2021



January

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

February

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

March

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

April

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

May

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

June

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

July

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

August

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

September

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

October

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

November

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

December

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Seasons

Show the video up to 10 minutes

Seasons And Many More Rhymes | Rhymes And Songs Compilation F…

We have three main seasons in a year: rainy season, winter and summer. These last for a couple of months and come in the same order every year.

Rainy season is when the school re-opens after vacations. It rains often and then you have to use umbrellas or raincoats.

Winter After the rainy season comes winter, when it gets colder and colder. You have to wear sweaters, caps and mufflers. You like to eat hot snacks.

Summer After winter comes summer, when it gets hotter and hotter. When it gets very hot, you have long summer vacations. You like to have cold drinks and eat ice cream.

Exercise 9

1. How many days are there in a week? Name the days of the week in order beginning with Sunday.

2. How many months are there in a year? Name the months of a year in order.

3. Fill in blanks
   March is the ___third_____month of the year.
   June is the _____month of the year.
   November is the _____month of the year.
   December is the _____month of the year.
   Monday is the _____day of the week
   Friday is the _____day of the week
4. Name the
   (a) second month of the year.

   (b) eighth month of the year.

   (c) tenth month of the year.

5. Name the month in which the Christmas Vacations start?

6. Name the month in which the Summer Vacations start?

7. Which vacations last longer, Dussehra or Summer vacations?

8. Name the

   (a) second day of the week.

   (b) fourth day of the week

9. If today is Wednesday, name the day tomorrow.

10. If today is Monday, what day was yesterday?

11. Write the date today.

12. Write the date 5.7.2004 in two different ways.

13. On which day or days is your school closed?

14. Name the day that comes after Monday.

15. Name the day that comes after Friday.

16. Name the day that comes before Wednesday.

17. Name the day that comes before Thursday.

18. What is the date on the second Saturday of March?

19. Mahatma Gandhi's birthday is on the second October. Find the day of the week on which it would fall in the year 2021.

20. When is your birthday? Find the day of the week on which it would fall this year.

21. Where do you find dates written in your surroundings?

22. Name the main seasons.

23. What do you like to do in summer?

24. What do you like to do in winter?

25. What do you like to do in the rainy season?

UNIT 10

Patterns

Show the video: https://youtu.be/wfAyddSr9_w

We create patterns when we arrange actions, objects, figures, numbers in a particular order and repeat them over and over again.

We can also create patterns by using a rule.

Example 1

Create a pattern beginning with number 3, so that each number is 3 more than the previous number.

The numbers in this pattern will be

3, 6, 9, 12, ...

Example 2

Create a pattern beginning with number 20, so that each number is 2 less than the previous number.

The numbers in this pattern will be

20, 18, 16, 14, ...

Activity 10.1

Show some patterns such as A, B, A, B, A,B…

A, B, C, A, B, C, A, B, C… on the blackboard and ask students what would come next?

Ask students to make patterns with blocks, chips or leaves of different shapes, sizes, and colours and ask them to describe the patterns made by them

Copy and extend the patterns made by others.

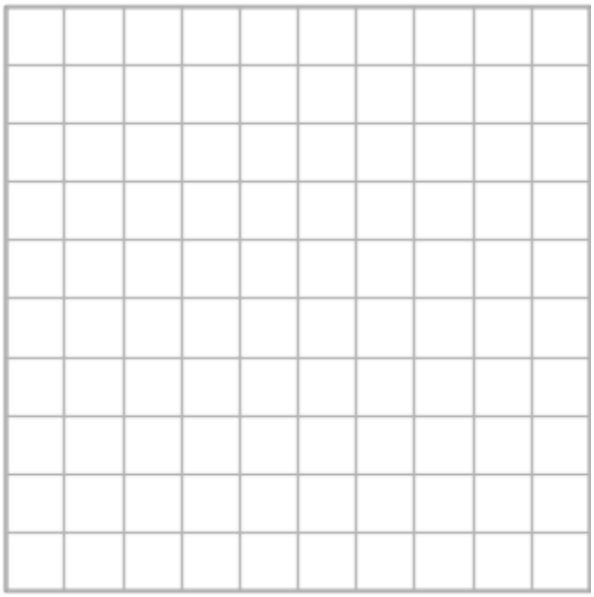
Activity 10.2

Cut the shapes given in Activity Sheet 1 and make patterns with those and describe them.

Copy and extend the patterns made by others

Activity 10.3

In the grid given below make patterns by using crayons of different colours



Copy and extend the patterns made by others.

Activity 10.4

Find patterns in your surroundings (Clothing, borders of saris, wrapping paper, calendar) show and describe them in class.

Activity 10.5

In a hundred table given in Activity Sheet 2
What pattern do you notice in each row?
What pattern do you notice in each column?
How are the patterns in different rows the same?
How do the patterns in different rows differ?
How are the patterns in different columns the same?
How do the patterns in different columns differ?

Activity 10.6

Note the pattern in each of the following series of numbers. Write the next number using the pattern.

1, 3, 5, 7, ___

6, 9, 12, 15, ____

7, 6, 5, 4, ___

6, 8, 10, 12, ___

15, 20, 25, 30, ____

50, 60, 70, 80, ____

10, 8, 6, 4, ____

20, 19, 18, 17, ____

14, 12, 10, 8, ____

4, 8, 12, 16, ____

Activity 10.7

In the hundred table given on next page, what patterns do you notice in
(a) each row? Is it the same in all rows?
(b) each column? Is it the same in all columns?
(c) Create some patterns using the table.

Hundred Table

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

In the addition table given below:
(a) What pattern do you notice in a row?

(b) Is the pattern the same in each row?

(c) What pattern do you notice in a column?

(d) Is the pattern the same in each column?

(e) What pattern do you notice in the diagonal cells(coloured blue)?

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

UNIT 11

Collection, Organization and Interpretation of data

Show the video upto 10:32 minutes:
Tally Marks, Picture & Bar Graphs | Math for 1st and 2nd Grades | Ki…

Data

Data is a collection of information about one or a number of persons, objects, or groups.
The information may be **categorical** such as favourite game, TV show, subject for a group of students. The categories are not ordered.
Or the information may be **numerical** such as height of a person, number of children in family for a group of persons. It is ordered, that is a higher number means more.
When we have data about many individuals, it is difficult to interpret it and we need to organise it.

Activity 1

The teacher can ask each student the name of the fruit (orange, banana, guava, he/she would like to have for his /her lunch.
As a student names a fruit, the teacher can mark a tally(draw a line) under the fruit. The fifth tally may be marked across the four lines(𝍸) to make it easier to count. After all students have told about the fruit, the students can count the tallies and the teacher can write it in the row below that.

Number of Students who Prefer Different Fruits for Class 2

Fruit	**Banana**	**Orange**	**Guava**	**Mango**	**Other**
Tally marks					
Number of students who prefer it					

The teacher can then ask questions like the ones given below:
1. How many students prefer orange?
2. How many students prefer banana?
3. What fruit is preferred by the most number of students?
4. What fruit is preferred by the least number of students?
5. How many more students prefer orange to banana?
6. How many students are there in the class?

Activity 2

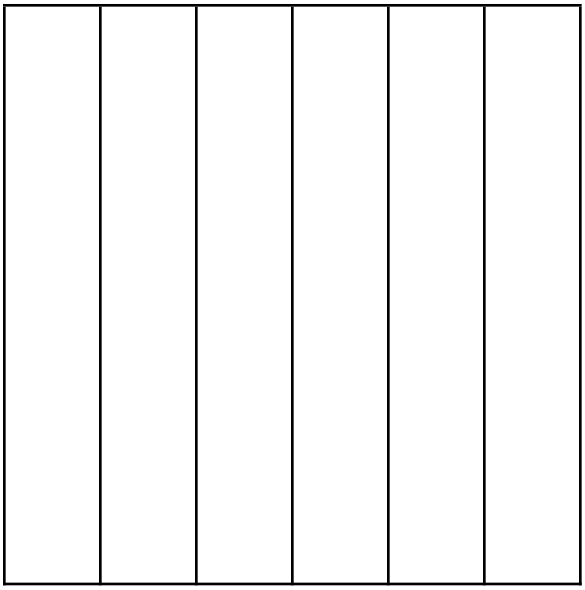
Ask a few children whose heights differ to come in front, and then ask the following questions to all the children:

1. Who is the shortest in the group?
2. Who is the tallest in the group?
3. Are there any children who are of the same height?
4. If we want to form a queue in order of height, which child should be in the first position, which child should be in second position and so on?
5. Repeat with other groups of different numbers of children and different variables
6. Repeat with sticks or other objects of different lengths.

Exercise 11

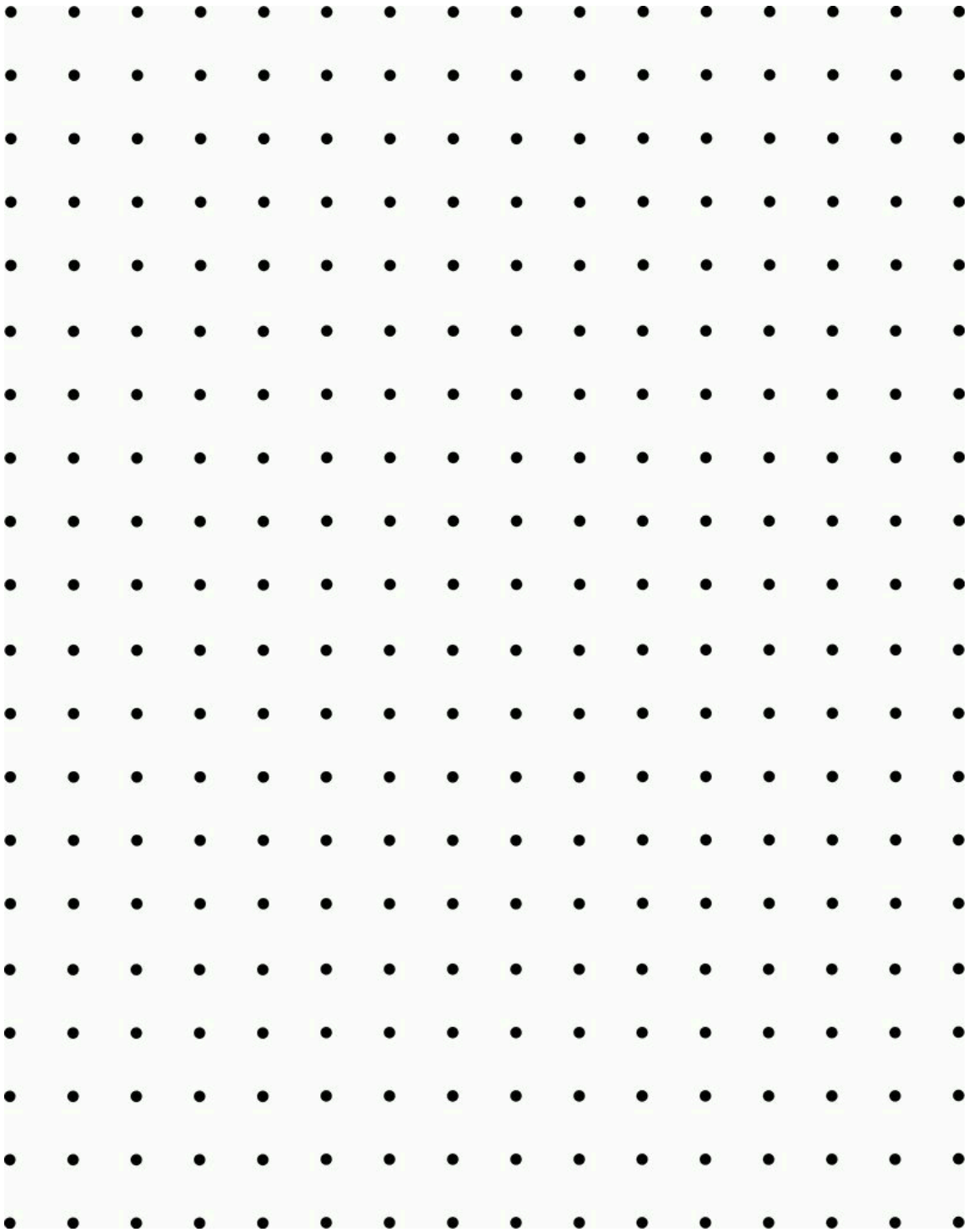
1. The teacher can ask each student to write the name of their favourite colour, type of TV show, game etc., number of siblings each has on a separate sheet of paper, She collects the answers to different questions, one at a time from all of them.
   Then she can divide the class into groups of 3 or 4 students and ask them to organise it as in activity 1 and present it to the class.

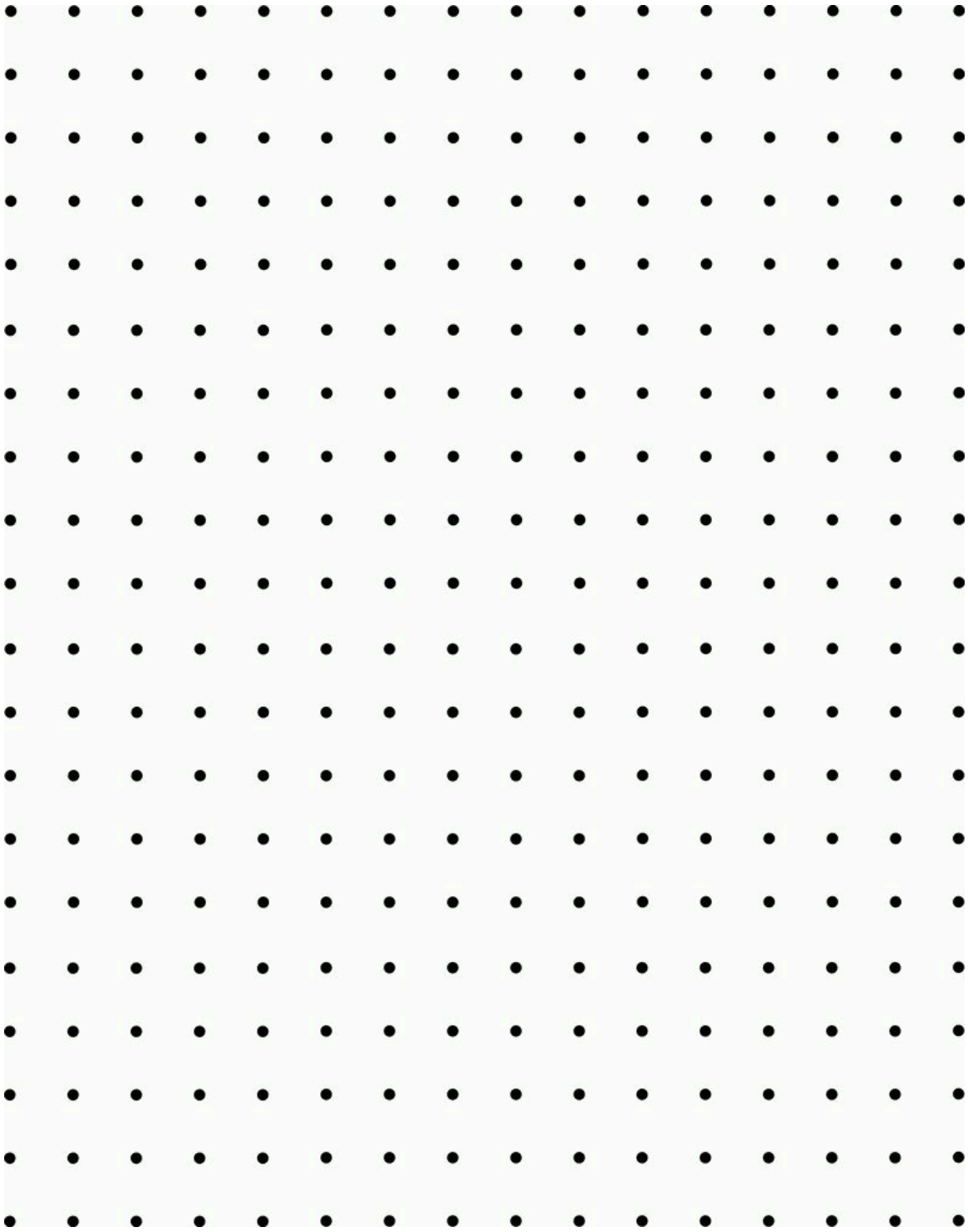
2. Cut vertically the pictures of pencils along the lines given in Activity Sheet 9.2 and arrange them in order of length in the Activity Sheet given below.



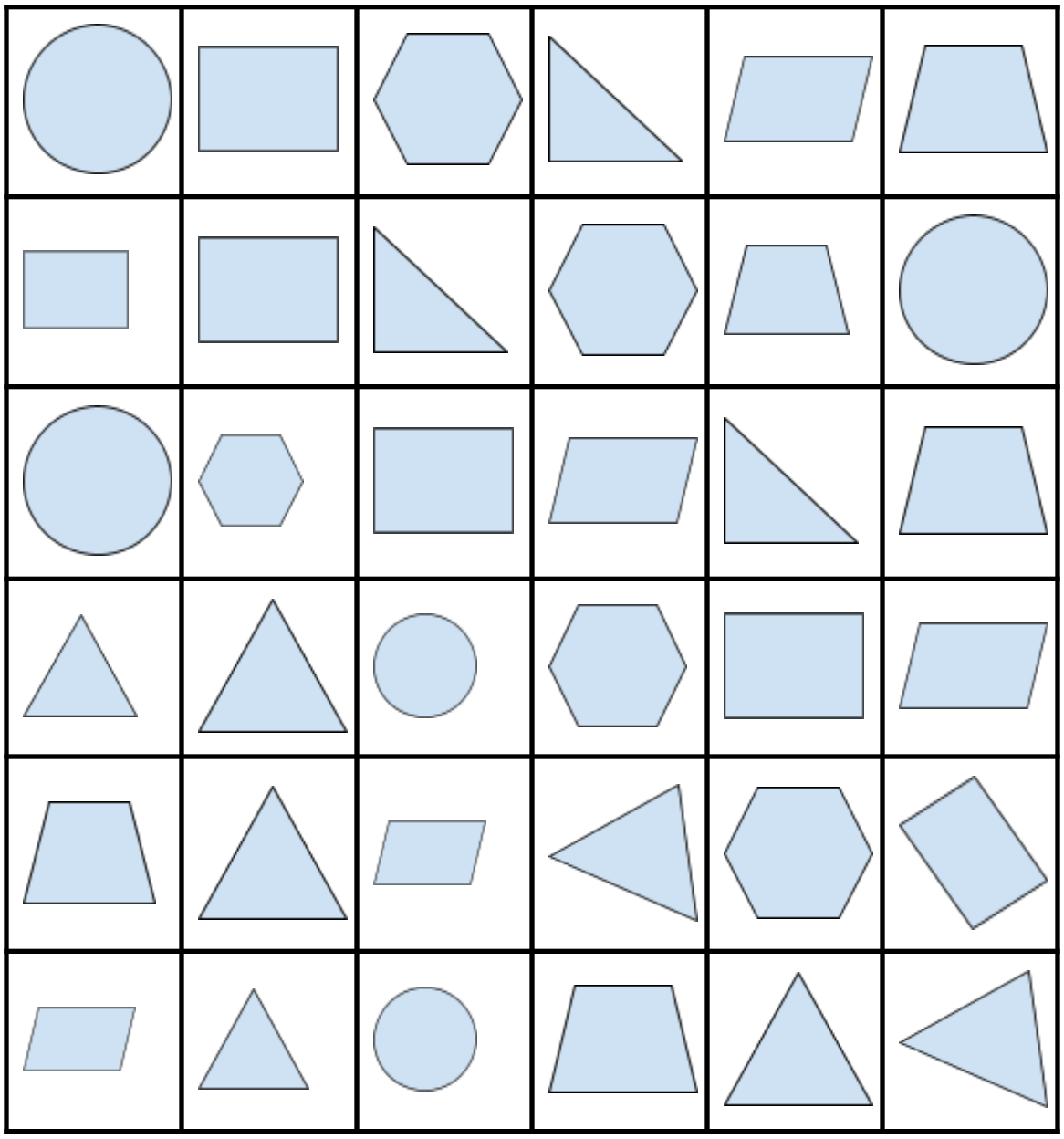
ACTIVITY SHEETS

Activity Sheet 2.1

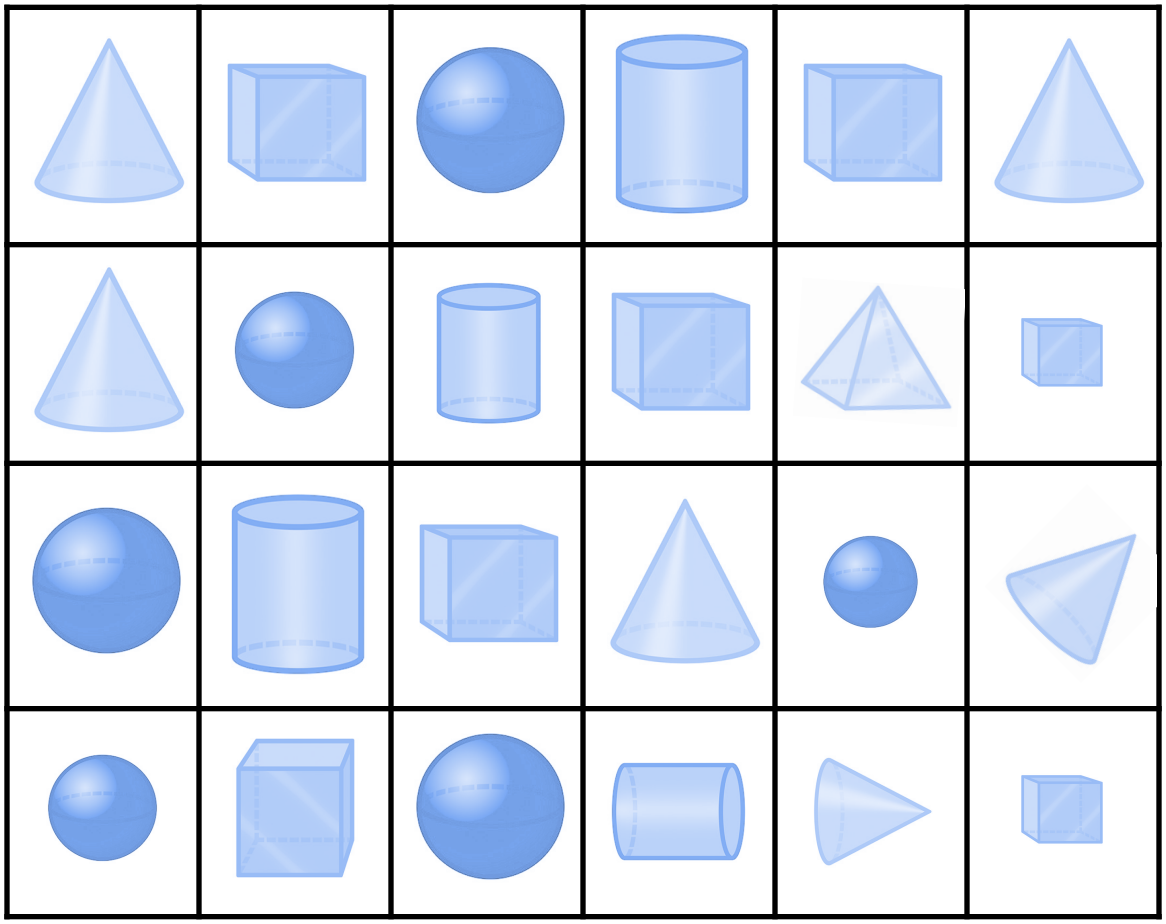




Activity Sheet 2.2



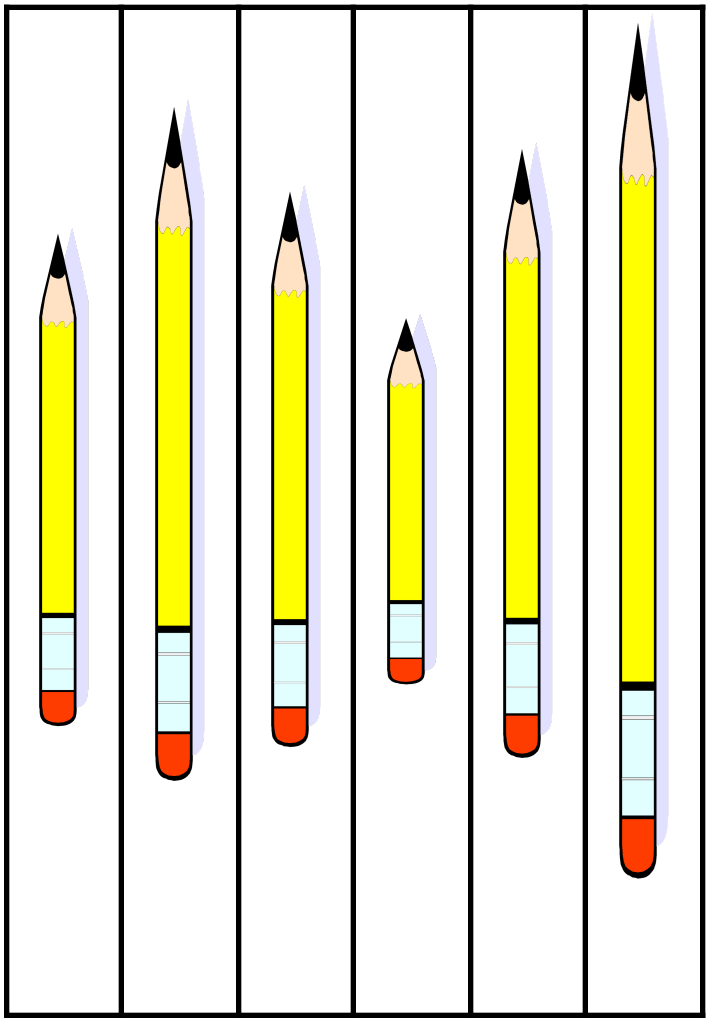
Activity Sheet 2.3



Activity Sheet 10- The Hundred Table

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Activity Sheet 11- Data on Pencils



APPENDICES

Appendix 1-Addition Table

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

Appendix 2

Mastery test on addition facts

4 +3 ------	5 +2 ------	5 +6 ------
7 ------	------	------
5 +1 ------	3 +9 ------	9 +4 ------
------	------	------
2 +1 ------	7 +2 ------	5 +8 ------
------	------	------
5 +5 ------	3 +3 ------	2 +4 ------
------	------	------
6 +2 ------	2 +1 ------	7 +3 ------
------	------	------
5 +1 ------	9 +2 ------	3 +6 ------
------	------	------

4	6	8
+9	+7	+6
------	------	------
------	------	------
6	7	6
+4	+8	+9
------	------	------
------	------	------
9	6	5
+9	+6	+7
------	------	------
------	------	------
8	8	8
+4	+9	+8
------	------	------
------	------	------
8	5	5
+3	+9	+3
------	------	------
------	------	------

2	8	7
+2	+0	+7
------	------	------
------	------	------
8	5	2
+2	+0	+3
------	------	------
------	------	------
4	9	4
+4	+1	+7
------	------	------
------	------	------
0	7	4
+0	+9	+5
------	------	------
------	------	------

Appendix 3

Mastery test on subtraction facts

Subtract

7	9	10
- 3	-1	- 4
------	------	------
------	------	------
6	7	12
- 4	- 4	- 3
------	------	------
------	------	------
5	12	10
- 1	- 7	- 3
------	------	------
------	------	------
6	10	9
- 2	- 1	- 3
------	------	------
------	------	------
7	11	13
- 1	- 3	- 5
------	------	------
------	------	------

14 - 5 ------	11 -4 ------	9 -7 ------
------ 15 - 8 ------	------ 12 -6 ------	------ 8 -6 ------
------ 13 - 6 ------	------ 11 -5 ------	------ 7 -2 ------
------ 6 -3 ------	------ 10 -2 ------	------ 9 -0 ------
------ 4 -2 ------	------ 13 - 7 ------	------ 18 -9 ------
------ 8 -4 ------	------ 12 -9 ------	------ 5 -2 ------
------ 9 -2 ------	------ 13 -5 ------	------ 12 -5 ------
------ 15 -9 ------	------ 14 -8 ------	------ 13 -9 ------
------	------	------

15 - 6 ------	17 -9 ------	14 -6 ------
------ 8 -2 ------	------ 16 -7 ------	------ 10 -8 ------
------ 12 -4 ------	------ 7 -0 ------	------ 14 -7 ------
------ 14 -8 ------	------ 13 -9 ------	------ 11 -9 ------
------ 11 -9 ------	------ 9 -4 ------	------ 9 -5 ------
------ 10 -0 ------	------ 5 -3 ------	------ 10 -6 ------
------ 11 -8 ------	------ 11 -7 ------	------ 9 -7 ------
------	------	------